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Vol. IV. Lumsden Building TORONTO, ONTARIO No. 10.

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JOHN W. S. McCULLOUGH, M.D., TORONTO

THE HARBOR OF INDIFFERENCE. AN ALLEGORY
GEO. D. PORTER, M.B., TORONTO

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J. R. MALEK, C.E., REGINA

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The Public Health Journal

The Official Organ of the Canadian Public Health Association

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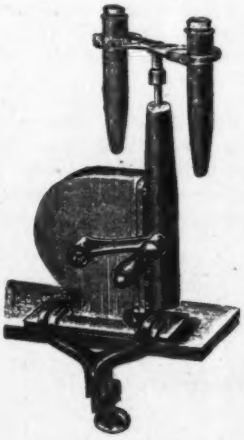

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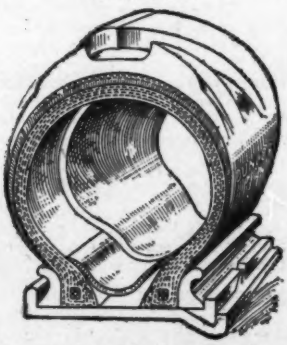

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HOW TO DEAL WITH THE FLY NUISANCE

House flies are now recognized as MOST SERIOUS CARRIERS OF THE GERMS OF CERTAIN DISEASES such as typhoid fever, tuberculosis, infantile diarrhœa, etc.

They infect themselves in filth and decaying substances, and by carrying the germs on their legs and bodies they pollute food, especially milk, with the germs of these and other diseases and of decay.

NO FLY IS FREE FROM GERMS

THE BEST METHOD IS TO PREVENT THEIR BREEDING.

House flies breed in decaying or decomposing vegetable and animal matter and excrement. THEY BREED CHIEFLY IN STABLE REFUSE. In cities this should be stored in dark fly-proof chambers or receptacles, and it should be REGULARLY REMOVED WITHIN SIX DAYS in the summer. Farm-yard manure should be regularly removed within the same time and either spread on the fields or stored at a distance of not less than quarter of a mile, the further the better, from a house or dwelling.

House flies breed in such decaying and fermenting matter as kitchen refuse and garbage. Garbage receptacles should be kept tightly covred.

ALL SUCH REFUSE SHOULD BE BURNT OR BURIED within a few days, BUT AT ONCE IF POSSIBLE. NO REFUSE SHOULD BE LEFT EXPOSED. If it cannot be disposed of at once it should be sprinkled with chloride of lime.

FLIES IN HOUSES.

Windows and doors should be properly screened, especially those of the dining-room and kitchen. Milk and other food should be screened in the summer by covering it with muslin; fruit should be covered also.

Where they are used, especially in public places as hotels, etc., spittoons should be kept clean as there is very great danger of flies carrying the germs of consumption from unclean spittoons.

Flies should not be allowed to have access to the sick room, especially in the case of infectious disease.

The faces of babies should be carefully screened with muslin.

FLIES MAY BE KILLED by means of a weak solution of formalin (40 per cent.) exposed in saucers in the rooms. This is made by adding a teaspoonful of formalin to a pint of water. The burning of pyrethrum in a room is also effective.

House flies indicate the presence of filth in the neighborhood or insanitary conditions.

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PROVINCE OF ONTARIO

Department of Education

Offical Calendar

September:

1. Last day for receiving application to write on Supplemental Matriculation Examination. (Up to September 1st.)
   Labor Day. (1st Monday in September.)
2. High, Continuation, Public and Separate Schools open. High Schools open, 1st Tuesday in September.) (1st day of September.)
   Last day for receiving applications for admission to Normal Schools. [Normal School syllabus.]
   Model Schools open. [Model School syllabus.]
8. Supplemental Matriculation Examination begins.
9. Septembe: Normal Entrance Examination in Lower School subjects begins.
23. Normal Schools open. [Normal School syllabus.]
30. Trustees to report to Inspector amount expended for Free Text Books. (Before 1st October).

October:

1. Principals of High and Continuation Schools and Collegiate Institutes to forward list of teachers, etc. (Not later than October 1st.)

   Municipal Council declares by resolution for forming Municipal Board of Education. On or before 1st October.) Notice by Trustees of cities, towns, incorporated villages and township Boards to Municipal Clerks to hold Trustee elections on same day as Municipal elections, due. (On or before 1st October.) Night Public Schools open (Session 1913-1914). Reg. 12. (Begin on 1st October.)
15. Trustees' Report on purchase for Public School Libraries, to Inspectors, due. (On or before 15th October).

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A Suggestion for Canadian Educationists

The
Public Health Journal

The Official Organ of The Canadian Public Health Association.

VOL. IV TORONTO, CANADA, OCTOBER, 1913 No. 10

Special Articles

PRESIDENTIAL ADDRESS

By JOHN W. S. McCULLOUGH

Chief Health Officer of Ontario.

President of the Third Congress of the Canadian Public Health Association, Regina, Sask.

This is the first time in the history of this great western portion of Canada that a Congress of sanitarians have met to consider questions respecting the care and preversation of the public health. From all portions of this great Dominion men and women are assembled here, many at great personal expense and inconvenience, for the purpose of aiding and prosecuting the thought uppermost in their minds, namely, that of preserving by preventive means the life, health and happiness of their fellowmen.

In no country, and, perhaps, least of all in a land so healthful and prosperous, and, at the same time, so extensive in area and young in history as this, are the efforts of those who are engaged in public health work quite appreciated. Few of the general public think how much a Congress such as this one may mean for the future of this country.

These Western Provinces have in the main part been peopled by the best blood of Eastern Canada, with a sprinkling of British, of hardy foreigners and of well-seasoned men and women from the Western United States, the latter being but a fair return to us of what we gave them in our younger and less prosperous days.

With the opening up of large new areas each year, with the rapid growth of your cities and towns, the question of water supplies, the disposal of sewage and garbage, the prevention of communicable and other diseases, the avoidance of slums, the care of milk and other food supplies become very personal matters, quite as important as the growing of first-class wheat and rearing of cattle for the British market. It is just for the purpose of drawing attention to these live questions that the Canadian Public Health Association is met here, and I venture to prophesy that the knowledge contributed in the various sections will be of lasting benefit to the whole country.

I have to thank the members for the very great honor they have done me in electing me President of this Congress. I do not pretend that it is a personal compliment. I take it rather to be a recognition of my native Province, which, perhaps, as it should, has made greater advances in public health work than any other part of Canada.

With such an extensive programme of the widest interest before you, it is not my intention to proceed with a long address, and, considering it might be of interest to you to tell you of some matters which are freshest in my mind, I decided to relate some experiences gained in a recent visit to Great Britain and the Continent where I spent the last two months.

In the Province of Ontario, from the fact that the rivers and lakes must become our great sources of water supply, it has become apparent that to preserve these supplies in a pure state, it is necessary to take prompt action to prevent their pollution with sewage. With this end in view, the Legislature of last year and this year gave very extensive powers to the Provincial Board of Health in this regard, requiring that all plans for waterworks and sewage disposal must have the approval of the Board before any money can be raised for these purposes. In addition, a further enactment gives the Board power to compel the construction of such works when in the Board's opinion they are required by an urban municipality; and such approval being made, no vote of the electors is required to raise money on debentures for these purposes.

During the present season the Board has engaged in making a careful examination of the rivers and lakes separating Ontario from the United States, beginning at Fort Frances and ending at the eastern boundary of the Province, with a view of discovering the causes and extent of what sewage pollution may exist. Following this, I was instructed by the Government of the Province to take up the study of sewage questions in Great Britain and other parts of Europe, and have just returned after seeing what I could in the last two months.

Of the many extensive works for the disposal of sewage in Great Britain, perhaps the most important are those of Birmingham, Manchester, and Glasgow. Many large cities, such as Liverpool and Edinburgh, have an easy problem—that of letting the sewage go out to sea with a rapid ocean tide. Others, like London, Belfast, and Glasgow, send the sludge or solids out to deep sea by vessels, but the hundreds of inland towns and cities must otherwise dispose of it. Since the great water supplies of Great Britain are taken from upland watersheds, it is not, generally speaking, so necessary to have as good an effluent as conditions in the most of Canada require.

The problem of dealing with sewage embraces the disposal of the sludge or solids, or the liquid portion of the sewage, and of the storm water. Each of these is a problem of importance and difficulty. From what I have seen it is apparent that the sludge problem is the most difficult one, while that of the liquid portion from a sanitary point of view, is, perhaps, the most important. As it would be quite impossible in the time at my disposal to discuss the various plants visited, I propose to take Birmingham as a type of British plant, and Essen as a German one.

As I did not observe what I saw at these plants through the eyes of an engineer, I am sure those present who are engineers will pardon me if I fail to speak other than as a public health officer who is looking for the best results to be found from a public health point of view.

Birmingham Sewage Disposal Plant.

	Acres.
Sewage area	68,935
Area of works and farm	2,956
Population of 1912 (estimated)..	947,932

Engineer, J. D. Watson.

The treatment of the sewage of Birmingham dates back to 1859, comprising two precipitation tanks of 2,000,000 gallons capacity at Saltley, with several acres of land for irrigation purposes. The purification by this means not being satisfactory, various chemical precipitants were tried, such as lime, lime and chloride of iron, Holden's process (ferous sulphate), lime and coal, Bird's process (sulphate of alumina with subsequent filtration through coke), Link's process (chiefly alum), and Forbes' process (sulphate of alumina).

In 1871, it was proposed to adopt land irrigation, using 2,500 acres of land for this purpose, but Parliament defeated the proposal, and 278 acres (which were inadequate) were laid out for irrigation and the tank capacity increased 100 per cent.

The growth of the town, an injunction granted some years before, and the foul condition of the river into which the effluent was poured so increased the difficulties that the Borough of Birmingham and adjacent townships united to form the main

sewerage district, controlled by the Birmingham, Tame, and Rae District Drainage Board, having control of

Birmingham,
Smithwick,
Sutton Coldfield,
Perry Bar,
Meridien (part of).

The district is supplied with upland surface water from Wales by the Corporation of Birmingham (90 per cent.), and from wells in the old red sandstone by the S. Staffordshire Waterworks Company. The hardness of the former is 2.3 degrees, and of latter 10.5 degrees.

Since the Board came into existence in 1877, the area of land for sewage purposes has been increased from 260 acres to 2,956 acres.

Following the year 1896, a large extension of irrigation works were constructed; following the year 1899 the settling tanks were increased to a capacity of 12,000,000 gallons, the storage at that time being 7,300,000 gallons, and storm water filters of coke breeze three feet in thickness with a superficial area of 20,000 square yards were added. These improvements made the Birmingham works the largest sewage farm in England, and the third largest on the continent of Europe.

Beginning with the year 1900, Mr. Watson began the experiments of purifying sewage on bacteria beds, using at first contact beds and later percolating filters. These experiments were so satisfactory that a biological plant has been constructed, including 54 acres of bacterial beds, storm water tanks, sludge disposal works, etc., at an actual cost, exclusive of land, of £380,350.

In making these improvements, the Board did so, not because they regarded the principle of purification by land irrigation as bad in itself, nor because they were dissatisfied with any part of the engineering works required to utilize the land for that purpose, but because they desired to make their works as good as possible in the light of modern discoveries, without overburdening the ratepayers. They did not lose sight of the fact that the sanguine expectations in respect to land irrigation, such as the reaping of large profits from this plan or the prophecies of twelve or fifteen years ago that the septic tank would destroy sludge, had not been fulfilled.

Birmingham Sewage System (Combined System). Volume and Character.

The ratio of the dry weather flow to the total annual flow is about 80 per cent. In 1911 the average daily dry weather flow was about 28,100,000 gallons, and is increasing each year, due chiefly to the popularity of the soft potable water from Wales, substitution of water closets for pan closets, and increased consumption of water for trade purposes.

The sewage from such a large district, comprising as it does large residential areas and enormous manufactories of various kinds, gives variations in its composition, but the great agglomeration of manufacturing concerns gives the sewage as a whole, a distinctive character. The character of the sewage varies in different districts and it also changes from day to day. At one time its oxygen absorbed equals 10 parts per 100,000, and at another 100 parts per 100,000. Some manufactories discharge acid waste, others alkaline. These tend to neutralize one another. The average annual alkalinity of the Birmingham sewage, including the Hockley sewage, is about 20 parts per 100,000, while that of the Hockley sewage is only 3 parts per 100,000. The manufacturers are not required to treat their trade effluents, but they are required to prevent great rushes of their wastes entering the sewers. At Bradford the manufacturers are required to treat trade waste.

A comparison of Birmingham sewage with that of other English and American cities shows that the dry weather flow at Birmingham is low and the oxygen consumed, albuminoid ammonia and chlorine figures are all high.

The impurity in a liquid rather than its volume increases the cost of treatment, therefore it is impossible to properly compare the cost of treatment per million gallons for various cities.

The process of purification at Birmingham may be considered under three heads:

1. To get rid of the solids in suspension without nuisance.

2. Treatment of impurities in solution so as to render the effluent fit to be dis-

charged into a running stream without injury to that stream.

3. Operations necessary for the treatment of storm water.

(1) Elimination and Disposal of Solids in Suspension.—This is the most difficult of sewage problems—the treatment of sludge.

(a) Detritus.—There are four main outfall sewers which intercept the sewers in the principal watersheds of the districts. These converge at Saltley just outside the city, and here enter the detritus pit, passing first through a grid of bulb bars 7 inches apart, sloping upward at an angle of 30 degrees from the invert of the sewer. This grid arrests timbers and other substances which would, if left, give trouble in a mechanically dredged pit.

The detritus pit is 240 feet by 14 feet at the surface, 19 feet deep and V-shaped, being just wide enough at the bottom to allow the dredger buckets to pass. The dredger is similar to that used at Shieldhall, Glasgow, and consists of a travelling bucket elevator supported on a four-wheeled carriage running on a standard gauged railway supported by cast iron pillars, thus leaving an open space from end to end of the pit into which the liquid from the sludge may drip without causing a nuisance. The perforated buckets are carried on an endless chain. A hopper and chute convey the detritus, consisting of sand, slack, rags, paper, faeces, etc., to a sludge truck which travels in front of or behind the dredger as it moves backwards and forwards. The dredger is worked by a 15-horse power motor.

The pit has a capacity of about 1,500 cubic feet per million gallons, treated, and the sewage flows through it at the rate of about 3 inches per second. When the sludge truck is filled, it is hauled by steam locomotive to the dump where it is said to create no nuisance.

At the Sutton Coalfield (Tyburn) works and the Cole Valley (Ashold) works, where the volume of sewage is about 2,225,000 gallons, the grosser materials are removed from a detritus pit of about 780 cubic feet capacity, by means of a stationary dredger, where the solids drain from the hopper and are conveyed to a horizontal trough fitted with a worm which conveys the material to a tip wagon stationed outside the building. This form of dredger is less satisfactory, especially as regards any repairing necessary.

The dredging of this sewage is followed by passing the sewage through two Carshalton screens. It has been found, however, that the sewage contained more organic matter after it was screened than before, thus adding unnecessarily to the work of the filter beds. This is due to the fact that faecal matter when agitated with water forms a colloidal solution, and the increase in the oxygen absorbed figured together with the increase in the colloidal matter present in the sewage liquor after passing the screens makes the use of the screens objectionable. The object of eliminating solids is to reduce the strength of the sewage liquid, but to brush particles of faeces over the perforations of the screens and afterwards to force sewage through these perforations must tend to defeat the object in view.

In 1911, the quantity of detritus removed from the Cole Valley (Ashold) sewage was ten hundred and eighteen million gallons, and the total cost of treatment, including annual charge, attendance, maintenance, interest on capital, power, etc., of the sewage was 5s. 7d.—$1.21 (about) per million gallons.

Sludge.—Is that portion of the suspended solids which is too fine to be lifted by perforated dredging buckets; it generally contains more organic matter, and, consequently, is more likely to give rise to smell.

In his evidence before the Royal Commission on Sewage Disposal, 1901 and 1906, Mr. Watson, the engineer, stated that no more than 10 per cent. of the sludge was got rid of by septic action. He referred to a complete riddance or conversion into gas independent of the benefits produced by liquefaction. It is apparent that the frequently made statement that 50 per cent. of the solids are got rid of by septic action is incorrect. Observers at Exeter, Leeds, Manchester and Worcester, Mass., all agree that sludge characteristic of the sewage of these towns is capable of being reduced by 25 per cent. of its volume after digestion in a septic tank. This is not the fact in respect to Birmingham sludge. It contains so much metallic salts that its fermentation is a matter of great difficulty. When land was irrigated with the crude

sewage from the Hockley sewer it has been known to kill a whole field of cabbages in one night.

After the coarse impurities are removed in the detritus pit, the sewage enters five sedimentation tanks where the sludge is deposited. In summer the sludge is removed from the tanks once a week and placed in one or more of the twenty septic or digestion tanks where it undergoes fermentation until the foul smell is gone; it is then pumped to the sludge drying beds at Water Orton, by means of two direct-acting steam sludge pumps with a combined capacity of 30,000 gallons per hour. In addition, there are two similar pumps with a combined capacity of 60,000 gallons per hour, which are capable of lifting the sludge deposited in the storm water basin and also of doing the work of the first set.

The mains, four miles long, are 12 inches and 9 inches in diameter, and the sludge is carried to any field wanted by means of branch pipes which may be connected to the mains as required. The total dry sludge is 67 tons per day, or 1,170 tons of liquid sludge containing 94½ per cent. of water.

Various experiments, such as the use of soot, lime and soot, parafin spray, "chloros" and bleaching powder were tried to get rid of the smell of the sludge. None were successful. Hypo acted best, but the success of this in laboratory experiments was not borne out in actual practice. The advantage of applying digested sludge to land rather than that treated by lime, which is in use in many parts of England, is the marked lessening of the smell in the former process. The digestion is probably due to the organisms having acted upon the organic compounds until there no longer remains any pabulum for their life, and the result is, that treated by the process described, Birmingham sludge has no bad smell.

Previous to 1904, Mr. Watson was of the opinion that it was impossible to septicize sludge without septicizing sewage liquid. By the evolution of the hydrolytic tank of Dr. Travis, of Hampton Court, and the improvements upon the latter by the invention of the Emscher tank, of Dr. Imhoff, the subject of producing non-smelling sludge was attacked in earnest. The essential features of the Emscher tank are its depth (20 to 30 feet), and its capacity of storing from three to six months' sludge.

It is an essential feature that the sludge shall contain a large quantity of its gases. This aids in drying as the gas keeps the solid matter up and allows the liquid to drain through the drying beds into the under-drains. Dr. Imhoff has obtained from his deep tanks sludge as dense as 70 per cent. water. The best at Birmingham is an average of 86 per cent. water.

The sludge drying area (at Water Orton) is 45 acres in extent, equal to about 239 square feet per inhabitant in the main drainage district. It is laid out in plots of 150 square feet, under-drained with four-inch agricultural tile in herring-bone fashion towards a main leader which takes the liquid to the well whence it is pumped to the bacteria beds to be treated as sewage.

The drying beds consist of a three-inch layer of washed engine ashes underlying three inches of finer ashes and each bed is surrounded by earthen banks about 2 feet high. Tramways are laid to allow the dried sludge to be easily hauled away. The tramway may be pushed through a breach in the earthen embankment to any part of the bed for convenient loading.

The time of drying varies according to the weather. If dry, it is said to quickly crack up and dry. The period varies from three to thirteen days, or in wet weather much longer. It is then conveyed to the tip, which is now 1,400 yards long, and in one place 15 feet deep. Nothing will grow on this sludge. It is proposed to use the filled land for railway sidings, and the assistant engineer told me it might be used as fuel, as it had about two-thirds the value of coal.

The total suspended solids amount to 52 parts per 100,000, or nearly 25,000 tons of dry matter per annum. This includes the sludge taken from the subsidiary silt tanks, the silt in the distribution pipes and the humus drawn from the bottom of the separator tanks (25 per cent. of the total), this being digested in the sludge lagoon the same as the Saltley sludge until it loses its smell.

Tank Treatment.

The sewage is freed of about 25 per cent of its suspended matter in the detritus pit and then passes in five parallel sedimentation tanks with capacity of over one million gallons each at a rate of 12 feet per hour.

This removes another 50 per cent. of solids. Another settlement is undergone in the balancing tank at Saltley before it enters the 8-foot conduit for Minworth. This tank has a capacity of about seven million gallons. At Minworth, before it goes on the beds, it passes through 22 modified Dortmund tanks with an aggregate capacity of 1,632,000 gallons.

From 1872-1900, the sedimentation tanks were used as chemical precipitation tanks, using milk of lime 12 grs. to a gallon. Then they were used as septic tanks, but in the hot weather it was found that the fluid became over-septicized and offensive. Then began the sedimentation treatment to have the sewage as fresh as possible for the filters. The following winter showed that merely sedimented sewage in very cold weather was very difficult to treat, as it was liable to choke the beds. It was found that the viscous condition of the sewage in cold weather produced an india-rubber-like coating over the surface of the bacteria beds, rendering them less pervious, and, consequently, less able to absorb either air or sewage. This was overcome by intermitting the sewage flow to the beds, the india-rubber-like coating having less tendency to form. Thus the fact was established that fully septicized sewage did not encourage this growth as fresh sewage did. The growth will not thrive unless it is constantly saturated with sewage. These facts led the engineer to continue fresh sewage in summer and septic sewage in winter, the proximity of the sludge digestion tanks making it easy to inoculate the sedimentation tanks in winter. It may be assumed, therefore, that in winter the five large tanks (capacity 5,610,000 gallons), the seven million gallon balancing tanks, the twenty-two slit tanks (capacity 1,632,000 gallons), will all be used as septic tanks, together giving 12 hours rest, and, as the 8-foot conduit may be regarded an elongated septic tank, there is an aggregate of 28,000,000 gallons capacity with a 17-hours rest.

One notices that it is five miles from the tanks to the bacteria beds (Saltley to Minworth). The reasons for this were:

(1) The belief that a 24-hour period of septic action was beneficial, and that the capacity of the 8-foot conduit (6,000,000 gallons) would obviate the need for increasing the tank capacity at Saltley.

(2) The difference between the falling gradient of the conduit (2 feet per mile) and the river (7½ feet per mile), provided an available head of 29 feet with which to spray the bacteria beds.

(3) The available head permitted the construction of the silt tanks at such an elevation as would enable the silt to run by gravitation to suitable land a mile away.

(4) The situation was isolated, space for extension unlimited, and railway and canal communication convenient.

Intake Chambers.

A mechanical device regulates the flow of sewage to these chambers, giving any desired rate of flow, and from the intake chamber the sewage goes to twenty-two silt tanks with an aggregate area of 19,420 square feet. These silt chambers eliminate suspended matter in the sewage, removing from 60 per cent. to 80 per cent. of it.

The silt tanks are a series of inverted pyramids with vertical walls rising to the surface. Each tank is 25 feet square and 20 feet deep. Sewage enters by a separate inflow pipe dipping down to the middle of the tank, the velocity at entry being 1 to 2 feet per second. This spreads out and rises to the surface, and the suspended matter drops to the apex of the pyramid or bottom of the tank. The head of water is sufficient (when a valve is opened) to force out this sludge either at the bottom or within 4 feet of the tank water level. The first six tanks constructed were 44 feet by 33 feet 6 inches. It was found that strainers were necessary to obviate the difficulty with fatty matter, as the fat interfered with the spray jets, and the use of the strainers has reduced the cost of maintenance per acre of the beds from 4s. 6d. ($1.08), to 1s. 7d. (0.38 cents)

Bacteria on Oxidizing Beds.

After the sewage is prepared as already described, it is sprayed over the surface of a bacteria bed, one of the functions of which is to convert the albuminoid ammonia present in the sewage into carbonic acid, free ammonia and nitrates. This is done by the organisms working in the presence of oxygen.

There are two forms of bacteria beds. One is a contact bed, the other a percola-

tion bed. The percolating bed was adopted for the following reasons:

(1) The belief that the success of the process was dependent upon the free admission of air into the heart of the bed and that the air supplied to a contact bed can only be equal to the volume of sewage treated, whereas it may be equal to many times that volume in a well-constructed percolating bed.

(2) The water capacity of the contact bed decreases day by day until it has to be taken off duty altogether for cleaning.

(3) Experiments with Birmingham sewage showed that the percolating bed gave better effluents.

(4) Where the effluent has to be let off into a river, great rushes let off intermittently are more liable to disturb the stream than a steady flow.

(5) Stronger sewage can be advantageously treated by increasing the depth of the beds.

(6) Percolating beds are cheaper.

The first four beds constructed are circular, 120 feet in diameter and one-quarter acre in area.

It is desirable that the beds should have a smooth concrete floor, that there should be no aeration under the medium and that the medium should be of good sound material, such as could be obtained within a reasonable distance of the site.

Various types of revolving distributor, such as the Mather & Platt, the Barker Mills (Adams), the Scott-Moncreiff, which was replaced by a Jones', and again by the Barker Mill (Candy) type are used.

At present the type of bed being constructed is of rectangular form, 6.6 acres in extent. The foundation floor is of concrete, 4 inches thick, with a gradient of 1 foot in 100 to the effluent chambers. The floor is covered with semi-circular aerating tiles, which are carried through the enclosing walls, so that air may pass from side to side of the bed. The enclosing walls are 5 feet in height, built of rubble stone, without mortar, 2 feet 6 inches at the base, battering 5 to 1 on the outside face, and where the walls are built transversely to the lines of tiles, the latter are carefully bedded and levelled on top with cement mortar, to form a foundation for the wall. The top course is finished in cement mortar. The medium, 6 feet in depth, is the best hard stone, larger than will pass through a one-inch ring and passing through a two-inch ring. The main supply pipe, 21 inches in diameter, is laid along the eastern wall of the block, and from this 10-inch branch pipes are led to the beds and extended to the opposite side, where they are connected to the washout pipe. These branch lines run across the beds at the surface in parallel lines, and at right angles to them; 3 inches distant pipes are laid in which the spray jets are inserted. The pipes are of cast iron, 6½ lbs. per foot, 3-16 inch thick (the maximum head being 10 or 12 feet). They are laid on the bacteria bed with special support, having Jones' expansion joints to couple them together. The actual cost of this block of 6.6 acres was £4,620 per acre.

There is no special virtue in any material, only it must be hard, not readily friable or liable to break down and capable of being broken into fairly cubical pieces, and that it is within reasonable cost.

Small medium retains the suspended solids near the surface of the bed for oxidation, but thereby tends to render that surface of the bed water proof, thus losing time available for the purification process so far as the lower portions of the beds are concerned, and consequently increasing the cost per million gallons treated. If the large medium is used, and solids are encouraged to pass through the bed, provision must be made to remove these solids before the effluent is allowed to flow into the river.

It has been shown that colloidal matters or other substances which are in solution when the sewage is applied to the bed become suspended matter by the time the effluent leaves the bed. In all sewages there are impurities that are readily got rid of in the form of gas, but there are others that undergo change slowly, such as colloids, and probably it is such matter that clogs the fine grain beds and causes the great loss of capacity of contact beds, and that constitutes the great bulk of the matter issuing from coarse-grained percolating beds. The engineer at Birmingham (Mr. Watson) advises against fine medium, as he has found that the use of medium under ¾

inch has increased the cost of the working of the bed.

To remove the solids in the effluent from the coarse medium, various plans were tried, such as fine sand filter (which was good, but expensive), (2) upward filtration through sand, (3) sedimentation in long shallow trenches, (4) sedimentation in shallow tanks, and finally a deep tank on the same principle as the silt tanks. This was entirely successful, the solids being reduced to 2 parts per 100,000, at a cost of 2s. (48c.) per million gallons, including interest on capital cost and disposing of the humus. It has been found that these beds will purify at the rate of 800,000 gallons per acre per day, or 85 gallons per cubic yard of medium. (Royal Commission figures give 80 gallons per cubic yard, on the assumption that the beds are to be ready to take double that quantity in time of storm.)

The only serious drawback to the percolating system on a large scale is the difficulty of distribution. The engineer thinks that this has been overcome by spraying the sewage under pressure.

The engineer is of the opinion that for a small or medium sized installation, a rotary or for rectangular beds a moving distributor will be satisfactory, but for the Birmingham sewage nothing, in his opinion, equals the spray jet. There is no uniformity of distribution in the strictly correct sense of the term by any means.

The engineer once held the opinion—and we found this very general amongst the attendants at the various works visited—that in consequence of capillarity a bed held liquid like a sponge, no matter how it was distributed upon it, and that if the bottom of the bed could be seen drops of water would be found at fairly equal intervals. Observation and experiment at Birmingham showed, however, that as the liquid was dropped on the surface, so did it emerge from the bottom.

Various forms of jets are in use at Birmingham, amongst them the Bryan (a fixed spray jet, designed by the assistant engineer), and the Crown type.

Storm Water.

The present works at Birmingham have a capacity for treatment of six times the dry weather flow, this being the requirement of the Local Government Board and the finding of the Royal Commission on Sewage Disposal (Fifth Report), that is, that six times the normal dry weather flow should be treated in one way or another before the sewage, plus the storm water, is allowed to enter the river. The Commission, however, recommended stand-by tanks rather than a straining filter as a better plan of keeping solids out of a river in time of rainstorm.

The storm water basin is 965 feet by 270 feet, and divided into three main compartments, the two nearest to the inlet channel being divided into three sludge bays on each side of the channel, which conveys the clarified liquid to the river.

When the sewage exceeds three times the dry water flow, it gravitates to the storm water basin, from the end of the detritus pit by way of a 7-foot diameter conduit, which is controlled by an electrically operated penstock. As the storm water flows eastward, it enters the inlet channel, which runs parallel with the southern end of the tank. There are six rectangular penstocks on each side of the outlet channel, and as these are opened the sewage flows northwards, depositing the grosser solids in the sludge bays formed by the submerged walls, over which it must pass before reaching the settled water basin.

The sludge is pumped through a suction pipe, of cast iron, 15 inches in diameter, and is forced to the sludge depot, through a 12-inch cast iron main four miles distant, as much supernatant water as possible being removed in a decanting channel in the main dividing wall. With the works constructed and under construction, the provisions for taking care of the storm water at Birmingham are very complete. The normal dry weather flow at Saltley is about 25 million gallons per day. Three times this quantity is allowed to pass through the sedimentation tanks and cross the river by inverted syphons to the balancing tank, whence after settlement it flows either to Minworth, or is pumped on to the excess flow bacteria beds. Other three dilutions are conveyed to the storm water basin, from which it passes to the river after the solids are eliminated, the balance passes over the flood weir to the river.

The whole installation is as follows:

Thirty acres of dry weather flow bacterial beds at Minworth; 24 acres of excess flow bacterial beds at Saltley; 7 acres of dry weather flow bacterial beds, and 10 acres of excess flow bacterial beds, and a standing or storm water tank of 7,000,000 gallons capacity in course of construction.

The beds at Saltley for the storm water are constructed with concrete 3-inch floors, laid on a layer of fine ashes. The aerating tiles are placed in rows at right angles to the effluent channel, at intervals of five feet, and between the tiles are placed large boulders to drain a space of 30 inches on either side of the semi-circular tiles. Large washed ashes from the Birmingham Gas Works are placed on top, and the medium to within 9 inches of the top is washed, screened and graded ashes of a size 3 inches to 1½ inches. There are no enclosing walls.

The effluent from the Birmingham works is poured into the Tame River, a very small stream. Indeed the effluent has a greater volume than the river itself. The average measurement of the flow taken in wet and dry weather (including floods) at Saltley is 2,590 cubic feet per minute. As the population of the watershed above the Drainage Board's district is over 1,311,000, and that of the district about 950,000, this at 30 gallons per head makes the volume of sewage 5,000,000 gallons per day, greater than the volume of water in the river at Saltley.

The whole motive power of this immense sewage works is electricity, part of which is generated by the steam plant at the city's garbage destructor on the grounds, this being augmented by city electrical power.

Yardley Sewage Works.

The Yardley district of Birmingham has two outfall sewers, one at Cole Hall and the other at Acock's Green. Formerly there were precipitation tanks and land irrigation. These have recently been replaced by a biological plant at Cole Hall, which includes septic tanks and bacteria beds. These works are under construction, capable of dealing with the dry weather flow, and later provision for storm water will be made. At present a clinker filter bed and land are used for this purpose.

The sewage is distributed to the rectangular filters through a long trough, from which it is syphoned on to a small overshot water-wheel, which provides the power for propelling the distributing carriage. The results are very good.

Essen Sewage Disposal Works.

(Imhoff "Emscher" Tanks.)

The Emscher sewerage district in the coal and iron district of South-Western Germany is unique as regards certain features of its organization, under a Board or "Genossenschaft." The history of this organization practically begins with the investigation of 1902, by a number of municipalities and interested corporations, forming an association to enquire into the unsatisfactory sewerage conditions theretofore obtaining throughout the whole valley of the Emscher River, covering an area of 308 square miles, with a rapidly increasing industrial proportion of about two millions, of an average density of approximately 6,500 per square mile. The report of the chief engineer, Middledorf, presented Jan. 1, 1904, resulted in the submission of an Act of the Prussian Government (English translation of which can be obtained from Chas. Saville, care of Herring & Gregory, 170 Broadway, New York City), under which, in 1906, the Emscher Board was created, having wide powers in the control of water courses, the compelling of municipalities to provide proper sewerage facilities in accordance with designs of the Board, the building and operation of works and the assessment of such municipalities and interested corporations to defray cost of same. The Board has full control over all water courses in the district and makes such alterations in location and elevation of channels as it considers desirable, entirely irrespective of highways, railways and canals. It has also the right to take and hold all land necessary, and failing a satisfactory agreement with the owners the price is settled by the courts.

The Board, with headquarters at Essen, has a membership of over 100 members, comprising delegates from all the cities, farming communities and the various mining and industrial corporations ,also a number of (Prussian) state commissioners. Representatives hold office for a five-year term, so arranged that new

members form only a small proportion of the total. The full Board assembles about once a year, but a "working section" of 10 members hold regular monthly meetings. Of this section the State Commissioners for one-third, the balance being mayors of the larger cities and directors of the corporations. A Board of Appeal is also appointed, with final decision in the settlement of disputes.

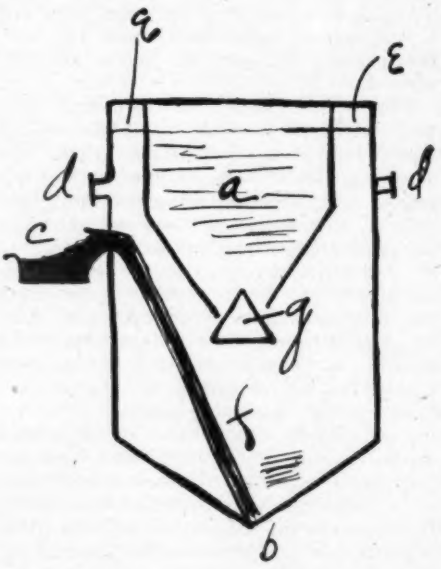
Many important improvements have been made throughout the area in the alteration of levels, construction of the V-shaped open channels, etc., etc. (the open sewer being preferred on account of greater aeration and less odor), but probably the most important feature has been the installation of the Imhoff clarification tank, the invention of Dr. Karl Imhoff, the chief engineer of the Board.

The Imhoff tank, perhaps better known as the "Emscher" tank, was first operated in 1906, and has been adopted throughout the Emscher district, and by some fifty other communities in Germany. They have also been used experimentally in Philadelphia, Chicago, Holmesburg, Pa., Atlanta, Ga., and have been recommended for Batavia, N.Y., Oswego, N.Y., and several other cities. The essential features of the tank have been patented in the United States and Canada. The amount of royalties is arranged on a sliding scale, according to size of population to be served.

The advantages claimed for the Emscher tank is the separation beyond possibility of re-entrance of suspended solids, the complete and odorless extraction of gases arising from decomposing organic matter, thorough septicization and frequent automatic removal of the sludge and complete separation from the effluent of grease and light floating matter.

The following rough diagram of a vertical section shows the main features of these tanks:

The sewage passes through the settling chamber in a direction perpendicular to the plane of the drawing. The suspended solids sink to the bottom and pass through the slots "g" "g" into the sludge well "f" beneath. Gases arising escape into the air through openings at "e," the overlap to the bottom slopes preventing its passage up through the sedimentation chamber "a." The sludge, after thorough septicization, gradually works its way down to the bottom of the well, and is removed, a little at a time, through the pipe "b-c."



Suitable scum boards are provided in the sedimentation chamber to prevent grease, etc., going out with the effluent. Previous to passage through the tanks large objects, such as sticks or tin cans, are removed by coarse bar screens, but it is considered undesirable to remove suspended organic matter previous to treatment in the main tank. In most cases grit chambers (with a settling time of only a few minutes) are provided for taking out sand and heavy mineral matters. The period of sedimentation ranges from one to two hours. The time for septicization of sludge is usually from 4 to 5 months. As the tanks are 25 feet deep or more, the process of "rotting out" takes place under very favorable conditions. The large quantities of gas rising from the sludge are found to be inodorous, being composed of approximately 75 per cent. marsh gas and 25 per cent. carbon monoxide, but practically no sulphuretted hydrogen.

The sludge when removed from the tanks contains from 75 per cent. to 80 per cent. water, and flows readily in con-

crete channels to the sludge-drying beds. These beds consist of 1-inch large cinders, then fine cinders, the whole topped with sand. The sludge in these beds dries rapidly, becoming firm and "spadeable" in from 4 to 10 days, and therefore very small drying beds are sufficient. It has absolutely no objectionable odor, is dark grey in color, and appears similar to porous garden loam. It is used for filling low areas around the disposal works and develops luxuriant vegetation after a few months.

Cost of operation averages about M. 10. per million gallons of sewage.

Dr. Imhoff expressed the view that the plan adopted by the Emscher Board of building and taking care of the sewage of a district according to its own plans is the fairest and least expensive way, secures uniformity and avoids duplication.

Asked as to whether the sewage is found to act injuriously on concrete construction, Dr. Imhoff replied that it did not unless there were septic action in the sewers, resulting in hydrogen sulphide, which makes sulphuric acid. There should, however, be a good fall in the sewer, otherwise it would be better to have glazed pipes.

Only the combined system of sewerage is used in Germany. Dr. Imhoff does not think the separate system would suit their conditions.

The first of the works visited was at Essen North, designed for 200,000 population, and now in operation for the past two years. Here the sewage amounts to about 350 litres per head population. Considerable trade waste is treated, containing a good deal of iron from a chemical factory in the vicinity. This iron is of assistance in effecting sedimentation. The sewage on its entrance passes through a coarse screen, the bars of which are about 4 inches apart. An ingenious arrangement of the storm water channels provides for automatic diversion in three different directions at dry water flow, 3 times and 6 times dwf, respectively. After screening the sewage passes through two grit chambers for the purpose of taking out sand, etc. The velocity here is 1 foot per second after passing the weir. The sewage next passes into cross channels leading to the 18 Emscher tanks. Dr. Imhoff called special attention to the horizontal flow type of bed, which is an improvement over the original design of vertical flow. In the vertical type the sewage flowing upward and the particles coming down cause considerable conflict, which is avoided in the horizontal flow. In the latter one hour is sufficient time for sedimentation, whereas the vertical type requires from 1½ to 2 hours. Methane gas escaping from the ventilator on one of the Emscher tanks was lit, and burned steadily. A discharge from the sludge tank showed an unusual quantity of water, explained by the presence of iron in the sewage. This sludge is very dark, and has a tar odor.

Discharges of sewage from factories are taken care of at Essen North works, where the factories discharge at regular hours.

The sludge from the pumping chambers goes into an underground pipe leading to a sludge well, from whence it is pumped once a week on to drying beds.

New concrete "digestion tanks" are at present in course of erection, which when finished will greatly lessen the amount of pumping at present necessary.

After drying in the beds the sludge is put out on the land 5 metres deep. At present a valley is being filled up in this way, and it is estimated that this will take two years.

The final effluent from the tanks is discharged 8 kilometres distant, through on open sewer to the Emscher River.

The amount of land controlled by these works include 2 hectares, occupied by the works, and 1 hectare, used for dumping the sludge. The Board controls this area, paying for the original cultivatable portion only, the whole property as improved to revert to the owner after a term of years.

Cost of operation about 10d. per head population per year.

The sedimentation tanks used at this plant are 11 metres deep. Ordinarily they are 9 metres deep by 7 inches diameter.

Dr. Imhoff expressed the opinion that the sludge under American conditions should have about six months for decomposition.

A system of reversing the flow in the tanks was described and its value for equalizing purposes explained.

In the course of subsequent conversation, Dr. Imhoff voiced the opinion that the final effluent from these tanks would be in good condition for sterilization by hypo-chloride, and would not consider filters necessary—in fact, does not think the filters would make much difference, and would be very expensive. He emphasized the view that filtration alone would not be sufficient for sterilization without hypo.

The second plant visited by the party with Dr. Imhoff was that at Essen West, designed for a population of 90,000. This plant has been in operation about five years and cost about M. 2.50 per head population. The whole plant is operated by one man. Here the sewage is entirely domestic, with some sewage from the Krupp Works. No iron. Takes care of the poorer part of Eseen, which part contains many cesspools. The five years' limit for removal of these cesspools has yet two years to run. Under present conditions the sewage is "smelly," but this will remedy itself with the removal of the cesspools. (The cesspools allow of septic action.)

The construction of canals and velocity of flow is the same as at Essen North. Sludge disposal is also the same, except that the sludge is 3 metres high on the lands after the five years' operation.

Fifteen Emscher tanks in operation at Essen West. No flies noticed at either of these works. Samples at all of the 20 plants in the district are taken thrice daily.

In Germany no sludge is allowed to return to the streams. The sludge at Essen West dries ordinarily in 3 or 4 days of dry weather. A heavy rainstorm at the end of this period would cause a delay of about 24 hours. Land at this plant comprises 1 hectare.

In conclusion, it may be said, considering the fact that in Canada (particularly in the middle Western Provinces and in Ontario), the water supplies must come largely from the lakes and streams, it seems to me that it will be necessary to secure a sewage effluent purified to a greater extent than any observed in Great Britain and on the Continent. While many of the effluents we saw were to the eye extremely good, none of them, in my opinion, could safely be allowed to enter a stream or lake used for domestic purposes without treatment of the water.

In obtaining a water supply, the source should be as good as can possibly be obtained, therefore, it should be protected in every possible way.

In the old land one hears little of the question of purification of sewage by dilution. Indeed, with the exception of a few cities, such as London and Liverpool, where the sewage goes to the ocean and cannot affect a water supply, it is not seriously considered.

A visit to the hundreds of plants for sewage treatment in England and on the Continent is a task requiring a great deal of time and energy. In the two months at our disposal we saw a great many of them, and perhaps the largest number of the more important ones. Visitors seeking information receive the same courteous treatment which we are accustomed to extend to parties from other lands. Indeed, sanitarians, scientists and engineers are good fellows wherever one goes.

I have to thank the members of this Association very heartily for the attention given to what I feel is rather a rambling talk, and I desire to express my gratitude for the very large attendance present at these meetings.

CONTENTMENT

What though a man be money-poor,
There's honeysuckle by the door,
Peacefully perfumed lavender,
And wilding weed and gossamer.

There's plenty cheese and plenty bread;
And russet ale, and apples red;
And breezes from the garden bring
A busy voice that loves to sing.

Songs of our happy English clime,
Of lily, lavender, and lime!
And children in the sunshine shout
For joy that tedious school is out.

Indeed, with friends, and cheese, and bread,
And russet ale and apples red,
And honeysuckle by the door—
How shall a man be counted poor?

—Thomas Burke, in "Pavements and Pastures."

THE HARBOR OF INDIFFERENCE

An Allegory

By GEO. D. PORTER, M.B.

Secretary of the Canadian Association for the Prevention of Tuberculosis

Read before the Third Congress of the Canadian Public Health Association, Regina, Sask.

Inspired with the hope of interesting more of the general public in our great tuberculosis problem, I shall endeavor to picture the conditions as they exist in Canada to-day in a nautical rather than in a technical way, trusting that however crude the attempt, this may prove to be the more acceptable.

Lacking in all those dramatic qualities which make the deaths in war and from accident so thrilling to us all, tuberculosis silently takes its toll and like some mighty undertow, slowly sweeps its victims into the great beyond, leaving scarcely a ripple upon the face of the waters.

* * * *

Somewhere under the blue skies of the Western horizon there may be seen one of the world's most spacious and magnificent harbors, but just outside of this lies a shoal which is covered with the wreckage and debris of numberless vessels which have foundered upon it. One wonders as he views the magnificent harbor and the beautiful city around it why some supreme effort has never been made to dredge away this dangerous shoal and prevent the appalling loss of life upon it. Although much money has been expended in fortifying the harbor against any possible invasion, and although constant inducements are held out for foreigners to come and settle in their midst, strange as it may appear, the greatest apathy has always prevailed regarding this melancholy spectacle.

Securely anchored in this harbor of indifference lies a fine fleet of large and well-appointed ships. Along the docks lie a number of other vessels, while many smaller craft steam up and down, and the waters are dotted with innumerable small boats and launches. On enquiry one learns that the fleet of large vessels represents the Federal Government, and it is explained that they have always been prevented from taking any active part in the saving of these lives owing to the British North America Act, which, they claim, consigns that duty to the nine smaller vessels representing the Provinces. These, however, have always been very busily engaged in safeguarding their rights. Mines seemed to them far more important than men; wheat gave them greater anxiety than did the lives of the women; cash concerned them far more than did the lives of their children. They assumed that the smaller craft representing the counties and the municipalities ought to be more interested in the saving of these lives, as they were in closer touch with them, but the latter pleaded poverty. They had to bear the expense of protecting the pockets of their people from possible robbery and pay for the police. They had to protect the homes of their people from any outbreak of fire, and pay money for that. They had to burden themselves with the expense of many local improvements without assuming such an important task as the saving of life. True they spent large sums of money in educating their children, but they failed to realize that a considerable portion of this was wasted, for many of these children came to an untimely end upon this same old shoal before they reached their maturity.

Floating in the harbor are also to be seen a goodly number of ships bearing white pennants with red crosses emblazoned upon them. These are the hospital ships, but as their berths are all occupied by passengers who are acutely ill, it is claimed that there is no room for those struggling from the stranded vessels. It has been said that whenever such a rescue had been attempted, these dripping victims were found to be so exhausted by their efforts and exposure that they had to remain in their berths for weeks and sometimes for months thus crowing out the more desirable class of passengers. Special state rooms have been suggested as being suitable for this

class, but, with a few exceptions, objections have been raised by the ships' surgeons, who were more interested in those suffering from surgical affections or in those having more interesting maladies. The officers also found that the expense of looking after these passengers remaining aboard for so long a time was considerably more than for those booking for a shorter passage. For such reasons the people have now come to look upon the hospital ships as being exempt from any duty in regard to the saving of these lives.

For years this general apathy prevailed throughout the harbor, until finally some of the small private boats put out and attempted a rescue, but owing to the choppy seas, they could do but little. Some of their owners then united in building and equipping a small life boat, which they christened the "Sanatorium." This was of some service, but owing to its size it proved to be entirely inadequate.

There were those, however, who believed that if it were only possible to dredge away the old shoal, named "Bad Environment," and remove the mass of wreckage and debris, call "Infection," these many disasters might be prevented, and so they brought the matter before the Federal authorities. The latter, however, claimed that the expense would be too great, but agreed that if the people were only properly warned of the danger, and that if buoys were placed conspicuously around the shoal, much good might be accomplished. With this object in view an association of public-spirited citizens was formed, and with financial assistance from the Government they proceeded to scatter warnings broadcast among the people, and they also placed a number of buoys upon the shoal. These warnings proved helpful for both the officers of the ships and the passengers who travelled on them became more on the lookout for danger, while the buoys were so placed that a clear course was mapped out for the vessels to enter. The curious haze usually lingering over the waters near the shoal, however obscured the zone of danger, so that in spite of the buoys, which were very small, numerous shipwrecks still occurred.

The many warnings, however, gradually aroused the people and broke down some of the strange apathy regarding this preventable loss of life. As a result, some of the Provinces, together with the municipalities and private citizens, united in building and equipping more life boats until now some thirty of them are to be seen in the harbor. These have been the means of rescuing many lives, but being nearly always full and inadequate in number, their usefulness is still very restricted. In spite of all these efforts the annual loss of life upon this shoal amounts to some twelve thousand, while the loss in money amounts to millions of dollars every year.

The most curious thing observable, however, is the attitude of the passengers upon these stranded vessels. Although many are very timid before embarking, a timidity which has been increased it is claimed by the many warnings of danger and by the sight of the buoys, yet when the vessel actually strikes the shoal it is observed that a most unusual apathy prevails among them. This is ascribed to the soft and shifting nature of the shoal which muffles the sound of the vessel as it noiselessly goes aground, thus giving rise in the breasts of the passengers to the most careless optimism. Indeed, the officers frequently have to warn them that the vessel is doomed and to urge them to make for their safety. Finally, realizing their danger, many make for the life preservers which are scattered conveniently about the deck. These are of the regulation shape and size, are canvass covered and bear the curious name of "Consumption Cures." Their worthlessness, however, is soon discovered, for owing to the scarcity of cork in these regions they have been filled with rotten sawdust instead. Those trusting to their buoyancy to uphold them fasten them around them and jump into the sea, but owing to their weight these life belts prove worse than useless and the struggling swimmer soon sinks into the deep.

Other passengers make for the life boats which have been curiously christened "Climate Cures." These are usually well designed and are painted in the most attractive colors. The second-class passengers and those travelling steerage seldom enter them, however, for there is always a large fee for doing so, but the majority of them are just as well off where they are for these life-

boats, being made of flimsy material, shrink on exposure, and when launched often spring a leak and those passengers are considered fortunate, indeed, who reach safety in them.

While watching anxiously the futile efforts of their companions in distress, some of the passengers hear a tremendous stirring of the waters, and, gazing into the deep, they behold a great sea turtle hoving alongside. Unlike most turtles, it makes a great noise and the attention of all on deck is soon attracted by it. Even those on the shore take notice, and the officers of the Federal Fleet turn their glasses upon it. Those on the small ships do likewise, and soon great excitement prevails, for is this not a new way of escape? The people crowd the docks to get a glimpse of it, and even the surgeons and officers of the hospital ships become interested. To be sure this turtle ought to prove the very thing, they exclaim, "for is it not an amphibous animal, both able to walk and to swim? And it is not shaped like a life preserver and as large as a boat?" Doubtful ones, to be sure, shake their heads and point out its slippery qualities, but all are eager. Those on the sinking ship are eager, too, and with much difficulty the turtle is secured long enough for some of the passengers to clamber upon its back. For a while it certainly gave much promise and raised everyone's hopes. Those upon the shore were favorably impressed, and as they beheld the strange animal heading towards them and saw the passengers upon its back waving enthusiastically, they became exultant, too. Their ardor was soon dampened, however, when they observed that one or two of the passengers slipped off the turtle's back into the sea, and it cooled still more when they preceived that the turtle which had been heading so straight towards the shore unexpectedly turned towards the sinking ship. Here some of the passengers becoming alarmed, jumped from off its back and climbed aboard again, but the majority still held on. Then the turtle headed again towards the shore, but after steering an erratic course, finally circled round again towards the sinking ship. A committee of experts was appointed to pronounce upon its merits as a life saver, but after observing these disappointing manoeuvres they pronounced their lack of confidence in this means of escape. This famous turtle has now left these waters, but is hovering around the sandbars of another neighboring port, where it has been subsidized, and any passengers in like danger may have the privilege of one trial upon its back for a fee of two hundred and fifty dollars, and if it fails to carry them to shore they may have another chance for a second fee of one hundred and twenty-five dollars, besides a few incidental fees to those assisting them upon its back.

While all this has been going on, however, some of the wiser passengers, not despising the more common means of safety around them, have, with the assistance of some of the crew, made a raft out of the loose planks and timbers lying at hand. One plank was named "Good Food," another "Proper Exercise," a third "Sufficient Rest." These were firmly lashed together with some large timbers, called "Fresh Air," while running crosswise were laid beams of "Sunshine" and some scantlings called "Cleanliness." The ropes used were woven from stout strands of "Perseverance," and, with the help of the sailors, they launched the raft and embarked upon it. While owing to the lack of sails, its passage was very slow and those upon it frequently complained of the tedium and the exposure, yet the majority of those who embarked upon it ultimately reached the shore in safety.

Some of the remaining passengers seeing their comrades' successful landing, then attempted to do likewise, but their delay proved disastrous for the sea gradually became rougher, and, weakened from want and exertion, most of those who now embarked were unable to cling to the raft and so perished on the way.

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Assuming that this picture roughly represents our tuberculous problem, are we not justified in urging all those in danger, until some safer way appears, to make for an early place upon one of these simple but seaworthy rafts; and are we not also justified in urging the Governments and the people not only to supply an adequate number of proper lifeboats, but to unite in dredging away this old shoal and in removing the wreckage and debris upon which so many precious cargoes founder?

SANITARY SURVEYS OF RIVERS

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In dealing with the subject of this paper, the writer wishes to state that the object in view is to make a few general remarks on the necessity of carrying out sanitary surveys of rivers and the general lines employed in carrying out such work, but does not propose to deal with sewerage purification works or water filtration plants situated on the banks of rivers and streams in this or other countries.

Object.

Sanitary surveys have all been carried out chiefly with a view to ascertaining the state of the streams which have been subject to contamination, either by the discharge of crude sewage of adjacent towns into the river or else by the general refuse of communities along their banks or through industrial wastes and the waste water from mines or quarries or other works too numerous to mention.

It need hardly be mentioned here that the duration of the work and the observations to be taken, may extend over any period from a few days, weeks or months to possibly one or two years, according to the ultimate object in view or to the size and varied conditions to be met with in the various rivers or waters under observation.

Results of Pollution.

Unfortunately, it is only too true that as civilization has advanced and the number of factories and towns have become the centres of manufacturing industries, that the tendency has been in the past to use these courses in their near vicinity as an easy and inexpensive means of getting rid of the ever-increasing filth and rubbish to be expected to collect from such centres, with never a thought bestowed on the trouble and future sickness in the shape of epidemics of typhoid, dysentry, cholera and diphtheria, not only to themselves, but to the towns and villages lower down on the same stream, which may be their nearest water supply, but to the farmers and dairymen whose animals water themselves in the river or at the pools left on the shoals.

The older countries have long ago realized the necessity of investigating the serious condition of their waterways, and extensive sanitary surveys have been carried out by some of their most eminent scientists, engineers and surveyors, with a view to ascertaining the extent of the contamination, which "Findings" are submitted in the shape of reports to the governments concerned.

The United States and Canada, both comparatively new countries, are likewise realizing the dangers likely to arise from the present state of pollution of their streams, rivers and great lakes.

In the States, two recent surveys will, no doubt, be fresh in the minds of those present (a) the thorough and exhaustive sanitary survey made of the "Potomac River" by Asst. Surgeon J. Goldberger. the full report of which is given in the "Report on the Origin and Prevalence of Typhoid Fever in the District of Columbia," which was brought out in 1907 in the form of a report by the United States Government, (b) the very recent extracts on the report by Messrs. Forbes and Richardson, of the sanitary survey of the "Illinois River," in connection with the pollution caused by the sewage discharge from the Chicago Drainage Canal.

The Canadian Engineer, of the 13th July, 1912, publish extracts from the report by Mr. James Meadows, sanitary engineer to the Board of Health at Quebec, on the survey of the Ottawa River, carried out by him.

The object of this survey was to arrive at the difference in the state of the river in 1910, compared to the condition when Dr. Wyatt Johnstone made his in 1891, when the population for Ottawa and Hull combined was only half what it was in 1910.

Dr. W. Johnstone, in July, 1891, found that samples taken at a point five miles below Ottawa, had 500 bacteria per cubic centimeter, the next highest return was at Thurso, a town thirty miles below Ottawa, when it was 201 bacteria per c.c., from this point they gradually diminished.

In September, of the same year, his next survey was carried out at a point 25 miles below Ottawa, the samples taken showed the number to be 1,530 bacteria per c.c. at a point 65 miles below the capital, they had diminished to 48 per c.c.

The survey carried out by Mr. Meadows in 1910 shows in nine years a very great increase of pollution in the river, owing to the increase of population and the discharge of sewage and factory wastes that was taking place.

At Pembroke, the samples taken gave 110 bacteria per c.c., at 113 miles lower down and seven miles below Ottawa, they showed 700 bacteria per c.c. The next highest reading was 1,000 per c.c. at a distance of 179 miles, after which it decreased rapidly.

In the October survey of 1910, when the water was at its lowest level, the samples taken showed that at Pembroke there were 43 bacteria per c.c., at Ottawa, 106 miles lower down, the samples had 100 per c.c., at 113 miles, or seven miles below Ottawa, 1,600 per c.c. The highest taken was at a point 133 miles away when the samples taken showed 1,900 per c.c. It there dropped to 1,450 per c.c., at a distance of 179 miles from Pembroke.

The above is given to show how severely even such a large river as the Ottawa may suffer through continued pollution taking place and the great value a sanitary survey is, in enabling the authorities to get a clear understanding as to its conditions.

Professor Heider, in 1893, in his extensive and prolonged sanitary survey of the River Danube, into which Vienna discharged its sewage, found that it was carried along the right bank of the stream, preserving its own bacterial characteristics and not mixing perfectly with the water of the river for a distance of more than 24 miles. Where sudden dips take place in the river bed it has been found that these act like sewage tanks accumulating sludge.

In a recent river survey carried out by the writer for a civil action in which the discharge of crude sewage by a small town was causing considerable damage to property lower down along the side of the stream for which the owner claimed damages, the sewer pipes had been placed in a diagonal line across the river, thereby forming a kind of groyne, throwing the current on to the opposite bank, which, owing to the gravel shoal that had been formed, set up a back current on to the plaintiff's land, causing lighter solids to settle along the bank and seriously damaging his property.

At a distance of 20 yards from the mouth of the pipe, the bed of the river shelved down and for some distance formed a saucer like hollow. It was noted when the river got to summer or normal levels, that the ordinary current had little or no effect on the deposits lying at the bottom and even with a "freshet," which increased the depth of the water by an additional five feet, it made no appreciable difference. It was found after careful examination that only after a rise of 8 feet above the normal, a portion of this matter got away, and that in the ordinary way the rapid shelving of the river's bed caused the current to pass over it, whilst the surface water was considerably disturbed, the portion beneath was not in the least affected until a heavier "freshet" came down and scoured out.

Dominion Health Commission.

It is with considerable satisfaction that we see that the Dominion Government has recently formed a Health Commission of 18 members to look into and report on the health of the cities and towns upon the banks of our rivers and streams in this country when it is to be hoped that they will frame such laws and regulations as will prohibit the discharge of untreated sewage and trade wastes, as well as other impure matters, which are liable to injure the health of the community at large, into the waterways, which should be looked upon not as ready made sewers, but as valuable national assets.

Surveys.

To get a general and fair estimate of what is taking place will of a necessity demand not only an inspection to be made during the open seasons or summer months, but also during the winter period when the streams and watercourses are "ice" bound,

to note the changes taking place as well as to obtain an idea of the rate of flow or the state of aquatic and animal life during this period.

To sanitary-engineers and sanitarians, sanitary surveys open up a very vast and at present almost unexplored "field" of operations, and as the population increases (as it does year by year), close investigation of the state of all waters will demand their unceasing attention if the preservation of the public health is to be their principal object.

The Government of this Province has already set an example to its sister Provinces by organizing sanitary surveys on a systematic scale of all its waterways and creeks, and perhaps a review of the methods now being employed to ascertain the conditions that are prevailing will not come amiss.

In the first instance, "waterways" to be surveyed, if within a reasonable distance, are always first visited to gain an idea as to the best means of surveying them in a thorough and expeditious manner to enable the engineer who is employed to make an exhaustive report.

Plans are then obtained of the section or area to be taken in hand, which, if on too small a scale, are enlarged to such a size as shall allow corrections to be made and measurements clearly marked thereon.

"Field sheets" are also prepared, such as will be suitable to meet the requirements of town or country, with the necessary questions printed on, to gather the data it is necessary to obtain and on which the report will be based.

Large plans, should be avoided, 24 in. x 20 in. are found the most convenient for outside work, each of which should be marked in "alphabetical" manner and pinned one on top of the other to a light drawing board or on to stout cardboard, which is swung over the back, when not in use, thus leaving the hands free.

Record plans on large sheets should in the meantime be prepared in the office as well as a "Record Book" into which is entered all the information obtained, so that it can be referred to from time to time or when it is necesary to take up the record part of the survey.

The surveys should be conducted at least twice in the same year, but owing to the extreme climatic conditions met with in this country, it is impossible to lay down any hard or fast rules on such a point, so much will depend upon the district, stream and the purpose for which the work is being carried on.

Where work in towns is concerned or such houses affected or likely to affect the survey situated along the banks of streams and creeks, information should be obtained and everything done to gather such data as shall enable a full report to be compiled.

A gauge is placed in the stream and the height of the water is taken, with the hour of the reading as well as the day, month and year, tests are also made as to the rate of flow of the current and the quantity of flow in gallons per second, the course of the current is noted and erosions due to this cause are also marked in as well, whilst large shoals of gravel and such as would be likely to affect the general run of the current are marked in on the plan.

A thorough examination of the banks is to be undertaken with a view to ascertaining the nature of the pollution taking place as well as the nature of any pools left behind which are likely to cause the breeding of flies (especially when near human habitation or from which dairy cows and others might be likely to water at) the bed of the river, creek or stream, where visible, is examined and a note of such aquatic plants growing there, also of the animal life or fish life, as well as that of insects. Soundings in shallow pools may be frequently taken where necessary. This may be taken by means of wading with a six-foot pole or rod marked in feet, inches and half inches, where deeper water is encountered and boats are not available, a waterproof tape with a conical lead may be employed and run over a pole with a small guide pulley at the end, the lead should have a slightly scooped-out bottom which, if greased, will serve the double purpose not only of sounding, but will also give a sample of the bottom which should be examined at the time, or kept for a more opportune moment when a fuller examination may be carried out.

Where sewer outfalls occur these should be noted on the plans with all the necessary measurements taken and if run out into the river, the angle should be carefully noted.

Sewage fungus should be looked for at these points, and a sample obtained for examination by the chemist, who may be employed to analyse the samples at the laboratory, the returns of which will be put in the final report.

Samples.

The writer always prefers to leave the taking of samples till the last, so that there may be as little delay as possible in getting them in to be tested owing to the rapid changes that take place where delay owing to distance is likely to occur, a little addition of formaldehyde or chloroform to the sample for dissolved oxygen test will usually help to keep it in the same state as when taken for about 48 hours.

The bottles to be used should be glass bottles with tight fitting glass stoppers (for preference) well sterilized, covered with a small piece of cloth tied down. When taking the sample the fingers are to be kept clear from the mouth of the bottle, which should be well rinsed in the water to be sampled and then filled to within half an inch of the stopper.

For deep water samples, the vessel to be used should be placed in one of the wire frames such as those made by "Messrs. Lentz & Son," with a specially constructed rubber stopper so contrived that when the bottle is lowered to the required depth the stopper can be lifted sufficiently to allow the water in, and, when released, closes automatically by means of springs. The writer has found that if a thermometer is attached to the sounding tape and enclosed in a light metal case, it is often possible to locate springs that otherwise might be overlooked. A reading is taken before it is lowered, and then at intermediate depths to allow for such variations of temperature as may take place in the water, the final reading being taken after a few minutes have been allowed for it to remain at the bottom.

Conclusion.

In conclusion, the writer would suggest that where important surveys are to be made, samples should always be taken and analyzed by a competent chemist, especially when it happens that the survey is being carried out with a view to finding out the actual conditions prevailing in the river as the preliminary step to arranging for a supply of water for a town.

SELFISHNESS

Diagnosis—

In a region of bleak cold wandered a soul which had departed from the earth; and there stood before him a hideous woman, profligate and deformed. "Who art thou?" he cried, "Who art thou, than whom no demon could be more foul or horrible?" To him she answered, "I am thy own selfish actions."—*From the Persian.*

Remedy—

"My dear children," said an old rat to his young ones, "the infirmities of age are pressing so heavily upon me that I have determined to dedicate the short remainder of my days to mortification and penance, in a narrow and lonely hole which I have lately discovered; but let me not interfere with your enjoyments; youth is the season for pleasure; be happy therefore, and obey my last injunction—never to come near me in my retreat. God bless you all." Deeply affected, sniveling audibly, and wiping his paternal eye with his tail, the old rat withdrew, and was seen no more for several days, when his youngest daughter, moved rather by filial affection than by that curiosity which has been attributed to the sex, stole to his cell of mortification, which turned out to be a hole made by his own teeth, in an enormous Cheshire cheese.—*Horace Smith.*

THE RELATION OF THE SOCIAL SURVEY TO PUBLIC HEALTH AUTHORITIES

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The relations between the social survey and the Public Health authorities represent to a considerable extent the relations between sociology and public health. These relations arise from the fact that sociology and public health are both interested in the same things—people; and have the same ultimate object—the promotion of human welfare. Sociology, to be sure, is interested in people from a wider point of view—studying such matters in their economic relations, their amusements and recreations, their education, and the causes of their poverty; while public health is interested solely in those conditions which affect their physical well-being.

No Clear-Cut Distinction.

So far, the affair seems simple: the sociologist will apply himself to the study of people in their many and complex interrelations; while the public health worker will confine his attention to the study and application of those parts of medical science which have to do with the prevention of disease. But the first attempts at a practical solution of the problems of sociology and public health show the entire fallaciousness of any such easy and clear-cut distinction; and demonstrate that the relations of the social worker and the public health worker are in many respects of the greatest intimacy. Hardly any of the sociologist's interests—such as hours of labor, wages, housing and recreation, but have a distinct influence on health, and so an interest for the health official; while the sociologist discovers that preventable disease is often the fundamental cause of poverty and the implied chain of problems. The discovery of these mutual interests has led to considerable misunderstanding and confusion; some a result of undue enthusiasm over the new ideas—such as prompts some persons to maintain that tuberculosis is purely a matter of wages; while others are caused by an undue adherence to old teachings, such as lead other persons to maintain that tuberculosis is purely a matter of restricting infection. Casting aside these misunderstandings, it becomes evident that the discoveries and methods of the social worker are now being fused with those of the sanitarian, and that a new public health is emerging.

Two Differentials.

As it is especially important that the health official realize the opportunities which this new public health offers him, and that the social worker realizes its true scope, we may attempt a brief exposition of the matter. Two striking characteristics differentiate the new public health from the old; on the one hand, the emphasis is being broadened from the mere sanitation of the inanimate environment to include the discovery and supervision of all infected individuals; on the other hand, the new work not only aims to prevent disease, but has become aggressive, and seeks to increase health in a positive manner. The new public health, not only inspects and supervises water supplies, milk supplies, privy vaults, and placards contagious diseases—as of old; it also instructs and otherwise aids mothers in the care of the new born; examines school children with a view to remedying physical defects; maintains free dispensaries, or other similar medical service, for the indigent; protects workers from occupational diseases; regulates housing; exercises the closest supervision over all cases of communicable disease; and carries on educational campaigns in health matters. The new public health recognizes the sick individual and the disinfection of his discharges as the strategic point of attack in the campaign against communicable diseases, and directs its efforts accordingly;

but it does not restrict itself to the communicable diseases, being eager rather to grasp everything that is a demonstrated opportunity to improve the general health.

Opportunities of Social Survey.

So far we have discussed the relations of the social and public health workers, and the relation of both to the new public health; what now of the social survey? What special opportunities does it offer, and what special services can it perform? The social survey is, of course, a stocktaking of facts regarding the problems of the sociologist and social worker; from another viewpoint it is a sinking of test holes into the community's existing social strata. As it aims to establish the status of all matters affecting the living conditions of the people, one of its most important investigations is that of health conditions. This investigation may have a dual aspect; on the one hand, the study of sanitary conditions in the city—conditions which it is the business of the health authorities to keep under routine supervision; on the other hand, the study of the health organization itself, and the adequacy of its programme. In all this health work the social surveyor may obtain such valuable assistance from the local social and public health workers; they know local conditions, and can usually cast interesting light on each other's work.

Special Advantages.

The special advantages offered by the social survey are those which accompany any public summing up of community conditions: it defines and expresses local situations, and focuses public attention on them. If the health department has no adequate programme and receives but niggardly support, the surveyor will not be long in discovering this state of affairs and bringing it forcibly to the public attention. The detached position of the surveyor is here of value, not only in detecting flaws in the local situation, but in carrying a note of authority which often will not be allowed the persons working with local conditions. The social survey should be, thus, of very real service to the public health authorities in securing adequate support for their endeavors.

Distribution of Functions.

Another service which the social survey should be able to perform is to advise as to the distribution of functions between the several parts of the municipal organization. The intricate and difficult problems concerned in the inter-relation and organization of public health and charity work is an example. In deciding such matters to the best advantage, the detached point of view of the surveyor, and his familiarity with the solution of such problems in other cities should be again of much real value.

Sympathetic and Helpful.

To sum up the situation, the special service of the social survey to local public health authorities may be arranged conveniently under three headings: First, the bringing of the full teachings and opportunities of the new public health—often overlooked by the busy routine worker; second, the focusing of public opinion on the importance of supporting adequately the local work; and, third, the advising in the organization and administration of work whose proper position is often difficult to determine. Certainly the relations of the surveyor and the public health worker must be intimate, and surely there are strong reasons why they should be sympathetic and mutually helpful.

ANGER

Diagnosis—

He that finds his knowledge narrow, and his arguments weak, is sometimes in hope of gaining attention by his clamours, and is pleased with remembering that at least he had the power to interrupt those whom he could not confute, and suspend the decision which he could not guide. —*Dr. Johnson.*

Remedy—

Seest thou not that the angry man looseth his understanding? Whilst thou art yet in thy senses, let the madness of another be a lesson to thyself.—*Buddha.*

LEAVES FROM AN INSPECTOR'S NOTE BOOK

By H. D. MATHIAS, A.R.S.I.

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It is frequently quoted that "there is nothing new under the Sun," and to produce a paper before an assembly of this kind without the reiteration of facts which are already well known, is almost impossible. Yet it may not be unprofitable for each of us to occasionally review, or revise, the knowledge of which he is in possession, and this is likely to be done to advantage after such a meeting as this, of those who are engaged from day to day in the interest of the health of the public.

The people's health is the highest law. It is to this end that we as sanitary inspectors direct our efforts in carrying out our duties. Our requests are not always met in the best spirit, opposition has frequently to be encountered, even to the point of obstruction. Prosecution is interpreted as persecution, and this should be undertaken only as a last resort. Much may be done by persuasion, in an educational way, and the inspector should equip himself fully in this respect. Herein lies one of the advantages of association; we shall be able better to urge our requirements and convince the people with whom we have to deal, of the reasonableness of our demands, if from time to time we meet together to compare notes.

The notes which have been strung together for this paper are not altogether reminiscent, and are not illustrative of the actual daily work of an inspector; they are rather notes designed to assist in the success of that work. Recollections of former experience would lead one to relate instances of unhealthy conditions, as they exist in other places, not only among the poor, but among those who are better provided with the necessaries of life. Much might be said about back to back houses, small ill-smelling cellars, with poor light and little ventilation, these having separate tenants from the houses above, about houses in courts with filthy closets used in common, of the dignity of the dwellers in these courts being so high that the closets were beneath notice, so that a pail was substituted and kept behind the sleeping room door, until its contents were putrid, and overflowing. Sanitary defects as regards drains and plumbing might have been treated, birds, rats and cats found in storage tanks, tanks fixed in improper positions, overflow pipes connected with drains, and the like, but such is not the object the writer has in view.

On beginning his training for the position of sanitary inspector, a man can hardly help being struck by the simplicity of the elementary statement on which all future work is to be pursued. Pure air, pure water and pure food, to which might be added unobstructed light, are the concrete materials upon which the superstructure of our work is raised, and if ever a doubt occurs it is well to call these facts to mind. In a primitive state there would, perhaps, be less difficulty in observing the demand, but progress brings complexities, and some of our difficulties. Deprived of either one of the three essentials man would starve, supplied with either in an impure condition he is poisoned, how quickly the result will accrue is merely a matter of time. Anything under a high standard of purity is likely to lessen a man's power to accomplish work and his ability to withstand the attacks of specific disease.

Air is stated to be the first great material for human existence, water the second. It is estimated that man can live without air little more than two minutes, without water for three to five days, and without food for ten days. But with us it is rather a question as to why with an ample supply of each his life should be shortened to any-

thing less than a hundred years, owing to a deficiency in the purity of either. Statistics prove the average life to have been considerably prolonged since the beginning of modern sanitary practice, and there is no reason why the average duration of life should not be still greater. That will be accomplished when the sanitary inspector and the public work shoulder to shoulder; when the inspector has educated those of his subjects who need it.

A pure atmosphere consists of about 79.1 volumes of nitrogen, together with 20.9 volumes of oxygen. By weight the proportions are rather different. Oxygen is the active, nitrogen the passive constituent of air. Carbonic acid is also a constituent, varying in proportion, an index of impurity. Other gaseous impurities are to be found in air, in either internal or external atmospheres. The purest air is found furthest from habitations of man or animals, and, perhaps, the worst, apart from that which is an immediate form of poison, is to be met in overcrowded rooms. Air which has been breathed has been deprived of its full life sustaining power, and has, besides, become contaminated with useless and injurious refuse matter. It is, therefore, obvious that it should not be taken into the lungs, and thereby through the blood into every part of the system. If it were anything but air, the idea of thus using it second hand, after its ejection by dirty, diseased and unwholesome persons, would be disgusting, but because the impurities are invisible, they are drawn into the lungs of men and women, not forgetting children, without a thought of their poisonous nature. The very idea of swallowing, or even tasting, the fluid substances ejected as excreta, or thrown off by disease from the body of another person, or even our own, is abhorrent to all, yet few scruple to receive by respiration impure exhalations, from the lungs of others, inhaling cutaneous emanations as well.

There are other gaseous impurities than carbonic acid, commonly called carbon dioxide, or CO_2, such as carbon mon-oxide, which comes from imperfectly consumed fuel, and a heterogeneous compound commonly designated sewer gas, which may arise, or something akin to it, from the decomposition of many organic matters, whether from sewers, drains or even from short lengths of untrapped waste pipes. Gaseous impurities may be also due to the effects of trade. Other impurities are suspended matter, such as road dust, seeds of plants, solid carbon, spores, germs and bacteria from organic matter. Oxygen is the purifying agent, necessary to the blood, the presence of any other gas means a lesser proportion of oxygen, a low vitality to those who have continually to depend upon it, rendering them more easily assailed by the attacks of infectious disease.

Then there are minor ailments, which may be attributed to an air deprived of some of its oxygen. It may be that sanitary inspectors are too prone to blame the system of drainage too readily, though a defect known to exist should not be tolerated, and overlook other causes which may be contributive. As an instance of this may be cited the case of a drain, which had been twice overhauled in the course of 12 months because members of a household had been intermittently subject to sore throats. Here, undoubtedly, the cause had not been the drains, for after a hood and a flue had been fixed over a gas stove, the ailment ceased.

All will agree upon the desirability of pure air, and it is unnecessary to labor the point, but it will, perhaps, not be a waste of time to give a little further consideration to the subject of air and summarize briefly the ways in which it is rendered effete. They are, in addition to overcrowding, from the products of combustion, from the presence of matters undergoing putrefaction and decomposition, and occasionally from the entry of sewage air. Combustion of fuel in a properly designed stove is an aid rather than a drawback, but stoves with defective flue pipes, stoves and lamps which have no flue connections, deprive us of a considerable proportion of the oxygen of the air. It is possible for decomposition to be a very slow process, and from constant association, not particularly noticeable to an inmate of a house, but it is none the less to be neglected. Accumulations of paper, shavings of wood, straw, old bedding, vegetables, stale food, ordinary house dust, and, in fact, any effete organic matter should be completely removed if the air is to remain fit. Fresh air must be admitted, a comparatively easy matter, but the draught may be more immediate in its

dire effects than the evil we have to correct. Whether a current of air is a draught or not will depend upon its temperature, and the problem is to get air in sufficient quantity without feeling its presence; the sight of a ventilator is sufficient to make some people chilly. Here in Western Canada, in the colder months, habitations are almost hermetically sealed, or, perhaps, it would be more correct to say that this condition is attempted. Yet in spite of the endeavor it is fortunate that a great quantity of the outer air gains admittance. It is approximately correct to say that some thirty thousand feet of air passes through a chimney in one hour, and if this volume did not come in it could not go out. It has been proved by experiment that even stone walls allow permeation, it is indubitable that doors and windows admit air when supposedly closed, and, more than this, air is continually coming into a lumber built house through the siding, through the roof shingles, and by way of the basement, sometimes, though not always, imperceptibly.

Whatever other means may be adopted as an aid to the influx of fresh air, there can be no doubt of the influence of the furnace and the stove. The atmospheric pressure within is less than that outside, there is, consequently, an induction at all apertures. The interior of a drain or a soil pipe will show a greater pressure than the house interior, and air more or less pure will be extracted from it, or push its way into the dwelling owing to defects, which may be referred to at a later stage.

A pure and ample water supply is no less important. Although the collection and distribution of water is looked after by those whose work is in a higher plane than ours, we should be acquainted with its properties and qualities. Rain is the primal source of all supplies, even though taken from deep wells, shallow wells, springs or streams. Rain water falling in an open country may be looked upon as a very pure form, but it is in a state which enables it to take up any soluble matter with which it comes into contact. In passing over land, or through the ground, something will be added to it, not necessarily dangerous to health, though that is possible. Water is never found chemically pure, and a good ordinary water may contain in various proportions, chloride and sulphate of sodium, carbonate of sodium, sulphate and carbonate of lime, sulphate and carbonate of magnesia, and a small quantity of organic matter, to the extent of thirty grains per gallon. Water is classed as either soft or hard, just as this quantity varies. A proportion of the hardness is removable by simply boiling the water; other methods concern us but remotely. Generally we may assume that hard waters form a protective coating on metals, and that soft waters give rise to suspicion, especially in the case of lead. Lead is not the only metal liable to attack, for the coating of galvanized iron, zinc, or even copper may form injurious compounds in certain waters. A peculiar action known as electrolysis, sometimes takes place when two or more metals are in contact, in water however slightly aciduous. Experience has shown that pure tin is the metal which gives the best results when pipes are used for domestic supply.

Nothing less than a chemical analysis, or a bacteriological examination of water, is sufficient to guarantee its fitness, but in making a preliminary examination we might take into account that a drinking water should be clear and bright. It may show a few sandy or chalky grains, but cloudliness, as though a drop of milk had been mixed in a glassful, would be a bad sign. When shaken it may show bubbles, which should rise quickly and break directly, but if they move slowly and hang about organic matter may be suspected. When either cold or hot there should be no smell, unless it be a slightly earthy odor, like that of clay on which rain has just fallen. If a water acquires a bad smell on being kept, that may be from decaying animal or vegetable matter acting on the sulphates in the water, forming sulphuretted hydrogen.

Although there may be a constant supply to those dwellings which have water laid on, so that tanks for storage may not be required, in outlying cottages it is often kept in uncovered vessels, and there is no doubt of its being fouled. Yet it is not impossible for street mains to be contaminated, for when the water is turned off for repairs that remaining in branch mains will flow back, air will follow the water through the ball cocks of closet cisterns, which are in turn in communication with the closet basins. There is also a danger where tile

drains and water mains are in the same trench. Bad drains mean a polluted subsoil and under similar conditions sewage may be taken into the water main.

The community must have pure air to breathe and pure water to drink, and that is the reason of being, for a health department with its complement of sanitary inspectors, whose constant endeavors are directed to this end. Climatic conditions are peculiar in this country, and though underlying principles cannot vary, methods which at first appear to be contrary to accepted rule, have to be adopted. In a temperate climate it is the best practice to keep all sanitary fixtures on external walls, to carry the waste immediately through the wall, to disconnect it from the drain at its lower end and discharge its contents through the open air, afterwards to disconnect the drain from the sewer, and to ventilate each part disconnected. In Saskatchewan such a method is impracticable. It is necesary to make an effort to obtain a system which will ensure uninterrupted work from one year to another. Fixtures and conduits must be so placed that they will not part with their heat, and disconnection as understood in other countries is impossible. Perhaps most thoughtful sanitarians will regret the absence of the main disconnecting trap, as this is undoubtedly a kind of isolation, a safeguard, in case of infectious disease. Yet one must come to the conclusion that the case for its abolition has been substantiated. With a main trap there must be a current of air traversing the main drain and the soil-pipe, to dilute and attenuate to the fullest extent the gases which are generated even on private property. Without this trap there is still a current of air, but at a very different temperature. When the trap is in use the incoming current is at the temperature of the outer atmosphere, round about zero for months, but if there be no main trap the temperature will be that of the sewer, and this may be safely assumed to be the greater. It is, therefore, obvious that under one plan the constant temperature will be below freezing point, while with the other it will be above. We may conclude that there will be less interruption of work without the trap in question.

We must not overlook the fact that each connection aids in the ventilation of the public sewer. Where house drains do not assist in this way it is necessary that the sewers should be separately ventilated, else the sewer air is much more offensive, dangerous in its effects, stagnant instead of diluted, and exuding from the street manholes in a concentrated state. It has been suggested that the abolition of the main-trap leads to frozen sewers owing to the greater volume of air at a temperature below freezing, which passes through them, but the remedy of fixing these traps merely transfers the evil in greater degree to each separate building. Probably the difficulty might be overcome by reducing the apertures in the street gratings during the time the excessively cold weather continues.

Ventilation, and venting, is sometimes impeded by the closing of the terminal at the upper end of the soil-pipe. How this may be postponed or altogether avoided is another question receiving anxious consideration at this time. There are two proposals, one being to jacket the portion carried above the roof, using non-conducting materials, the other is to keep the protruding pipe as short as is consistent with safety. There seems to be sufficient evidence in favor of the latter method to warrant its adoption. The importance of keeping this end open can hardly be over-estimated, for when it is closed the water seals of the traps are affected, they are safeguards no longer, and this happens at a time when the least quantity of fresh air is entering a building. The stoppage occurs owing to the vapor in the air from the pipe being condensed into liquid on reaching that point, and the liquid in turn becoming ice. A long length of pipe above the roof line will conduct away more heat than a short one, and if a non-conducting jacket be applied it is but a question of time as to when it becomes a refrigerator. It can but postpone the evil. A shorter pipe will require less heat to keep itself above freezing point, and will allow the vapor to be thrown clear of the terminal.

As bearing on these two likely occurrences, stoppage of the drain and the vent terminal by the formation of ice, it may be well to re-call the fact that water does not readily change from the liquid to the solid state. At 32 degrees Fahrenheit water may be either liquid or solid. In cooling from 33 to 32 one-pound of water will give out

one thermal unit, but before it can change into ice at that temperature it must give out 146.6 heat units. Stated in another way, the heat given off in the change is as much as in cooling from 174.6 to 32. We may say that water does not want to freeze, and if it were not for this property of latent heat we should have many more difficulties to contend with. Conversely we might note that it is as difficult to change ice into water, that for each pound of ice to be melted, the same number of heat units would be necessary. Water is delivered, as a matter of course, in the liquid form, and non-conducting materials are valuable on service pipes inasmuch that they enable the water to retain its heat, yet if the outer surface of the substance used were in an atmosphere below freezing point it would eventually be the means of cooling the contents of a pipe until solidification occurred. As the contents of supply pipes are usually in motion this does not so frequently happen.

By-laws demand a certain fall for waste pipes, and this fall is useful in helping the scour, yet it is no less useful in determining that the pipes shall empty themselves, and not have places where water might remain to be frozen, owing to abstraction of heat by the ventilating current or by cold air impinging on the outer surfaces. It is often stated that an empty pipe cannot freeze, but it would be more correct to say that an empty pipe cannot burst.

Enough has been said, for a paper of this sort, with regard to air and water, but there is still a point which might well not be forgotten when dealing with the hygiene of a dwelling, and that is the importance of light. Light is not merely a means by which dirt is discovered, it, like oxygen, has a chemical influence in favor of purification, as well as bringing warmth. A proverb tells us, "Where the light does not enter the doctor does," another, "All disease comes with the shade and gets well by daylight." These may not be literally true, but they serve to impress us with the fact that light is one of our agents.

The idea prevailing while this paper was being written was stated near the beginning, and, in conclusion, an apology may be offered for the superficial manner in which so much has been treated, still there may be underlying it something of use in stimulating enquiry, or in causing us to furbish our memories. In our school days we were always subject to recapitulation prior to examination, and now we never know when our next examination will take place.

IDLENESS

Diagnosis—

There is a satirical poem in which the devil is represented as fishing for men, and fitting his bait to the taste and business of his prey; "but the idler," he said, "gave him no trouble, as he bit the naked hook."—*E Irving.*

Remedy—

Dost thou not see the little plants, the little birds, the ants, the spiders, the bees working together to put in order their several parts? And art thou unwilling to do the work of a human being, and dost thou not make haste to do that which is according to thy nature?—*Marcus Aurelius.*

CHARITIES AND CORRECTIONS

By J. EDWARD STARR

Commissioner of the Juvenile Court, Toronto.

At the fortieth annual meeting of the National Conference of Charities and Corrections, held during the second week of July at Seattle, there were upwards of 650 representative Social Service workers, the large majority naturally having come from the far West and Pacific Coast States, a fact that gave to it an added interest; first, because its Western delegates had evidently kept in touch with the social trend of things in the East; and, second, because while having their own peculiar problems intruded from South America and the Orient, they were already seeking to prepare themselves for grappling with the social problems that are bound to come with the rush of immigration from Europe on the opening of the Panama Canal.

Another item of interest, and an occasion for the heartiest congratulations of the Conference, was that Seattle, after a hot campaign, had recently abolished its segregated district.

Of the varied work of the Conference, with different sections often meeting at the same time, it would be impossible to give even a bird's-eye view, but it may serve you to be informed of some of its conclusions.

I. With reference to the disposal of civic charity:

The Conference was practically a unit that for effectiveness the Clevland, Ohio, Federation of Charities easily led the way —the same plan, which, with what I think are improvements, Toronto has adopted in the organization of the Social Service Commission.

II. By the Sex Education Section, a resolution was adopted condemning physicians who advertise to cure private diseases, and urging that the use of the mails be taken from them and from any publication carrying their advertisements. Also this section endorsed the playground movement, and urged a systematic course of sex hygiene in all Normal schools, colleges and universities.

III. As a "good business proposition" and "a necessity for community betterment," the Social Survey, which originated in Pittsburg, and has since become part of the Russel Sage Foundation of New York, was enthusiastically approved of by the Conference. May I venture to add that along that line, rather than along the line of a Vice Commission, would be perhaps a more practical course of procedure for the Board of Control in their endeavor to meet the wishes of the Local Council of Women.

IV. Intensely interesting was the attitude of the Conference in regard to the care of dependent children. Though there, as here, these are the products of misfortune, shiftlessness, wife desertion and death, yet in the Pacific North-West the cause for the greater number of dependents is the divorce evil, a state of affairs that can be understood only in the light of the fact that in the year 1912 there were granted by the courts of that section 1,500 decrees of divorce, which was in the proportion of one decree to every three marriage licenses issued, and during the last fiscal year the State of California alone paid: first, through the Board of Supervisors for the care of dependent children in families, $201,000; and, second, direct to child caring institutions, $228,000, a total for the aid of 6,987 children of $429,000, a sum beside which the annual expenditure of the Province of Ontario for the care of dependent children seems pitiably small, so small that it is already pointing the finger towards a new form of revenue, if not direct taxation, as the only way in which to overtake our social and charitable needs.

At its last Legislature, however, California adopted a new plan of aiding dependent children, the salient features of which I shall refer to later. Meantime, the West at this Conference, as well as the East, were a unit as regards the care

of dependent children in the following particulars:

1. That they should not be herded for long periods in institutions in our cities to have their initiative and individuality supplanted by that singular constraint of manner inseparable from institutional upbringing.

2. That child caring institutions should be located in the open country, adjacent to our cities, and easily reached by means of electric railways, each with their receiving houses in the city, or, better still, but one co-operative receiving house for all dependent children, unhampered by any of the usual red tape rules that delay admission and having for its open sesame only the necessity of "first aid" to the child.

3. A Civic Board of Supervision, with powers to grant permits to formulate rules for and authorize grants to, or even close child caring institutions or organizations receiving civic aid.

4. A State or Provincial Board of Charities, provided with an adequate relief fund and a proper plan for its administration, with which city and county boards could co-operate.

5. All the preceding outline is with the view and for the purpose of not only correcting abuses, but also of lessening the maintenance expense by enforcing the (1) parental obligation, and (2) by giving greater efficiency and facility to what is known in charitable circles as the "placing out system," viz., the rearing of really dependent children in foster homes.

6. With regard to "the placing out" of children, undue haste was very properly deprecated. Family ties, it was held, should not be harshly or hastily sundered. If the child can be maintained in its own home or in the home of relatives, where the family relations can be kept, that should be done, unless the living parent or relative is found on ample evidence to be immoral, cruel or unfit to care for the child. Even when the widowed father or mother, or the deserted wife is unable to maintain a home for the children, it is almost inhuman to think of the parental tie being sundered simply on the ground of inability to support. Only homeless children or those whose homes have failed beyond hopes of recovery and whose physical and mental condition is such as to warrant it, should be placed in foster homes, and except for this class of really dependent children, as far as I could sense its feeling, the Conference regards as preferable to the "placing out system," the "compensation plan," the same plan that has been adopted in sixteen of the States of the Union, and which last year was adopted by California—the plan that is now in operation in Seattle and about which Judge Frater, of the King County Juvenile Court, after a year's experience, spoke to me in the most enthusiastic terms. Under this plan is involved, of course, State legislation and State aid, and while its underlying principle is the maintenance of the home, the plan in brief is simply this:

Aid is paid direct to the worthy mother in case of need to enable her to maintain her child in her own home, even if the State aid has to be supplemented by county aid. The State also gives aid to the child if it is maintained by a relative in case of need. When the widowed father or mother are unable to maintain the home for the children, they may be placed in an institution and receive State aid until the emergency is passed and a new home established; so the living parent is enabled to tide over the temporary difficulty and yet keep the custody of his or her children. With this plan goes also a vigorous enforcement of the parental obligation, and so that the father shall maintain and care for his children, provision is made for the prosecution of such parents under the law for failure to support. Even the father of the illegitimate child is held to be responsible as though he were the legitimate father and is forced to meet his parental responsibility. The plan is worked in connection with the Juvenile Court, and after due investigation by it and by the Civic Board, on its recommendation an order to pay is made by the Judge. As Judge Everett Smith declared:

"This is not an act of charity on the part of the State, but is clearly the obligation of the State to the unfortunate mothers of its future citizens, as its obligation to provide insurance and compensation for its working men disabled in hazardous employment. The preservation of the home by the aid of the State

is an assurance of the vitality and prosperity of the nation."

In view of this logical statement, possibly it might be great wisdom to jog the elbow of the Honorable Premier of Ontario, or, failing that, it might be recommended that next year a grant for the purpose mentioned, and under conditions easily summarized, be placed at the disposal of the Social Service Commission by the municipal authorities for distribution.

7. As to the Juvenile Court and Delinquents, about which I was chiefly concerned: The interest in the sections having to do with them was marked by the largest attendance at the Conference, the predominating ideas being the following:

(a) That the State Training School, as ordinarily conducted, is fast becoming a needless institution. First, because it is no place for the normal delinquent, the probation system of the Juvenile Court wherever tested having evidenced its efficiency for bringing about their recovery; second, because it is no place for subnormal children, viz., mental defectives—the place for them being the Colony Type Training School; third, because it is no place for the delinquent who is a young, defiant tough, his or her place being at what is known as the "Detention Home," with proper school and vocational training and opportunity for outdoor play and outdoor work.

(b) That the probation system, having proven wherever tested marvellously effective, endeavor should be made to make it even more effective, especially by the organization of State Probation Boards, through which could be made possible the selection of competent probation officers.

(c) That mental defectives (Morons) should not be sent to a State Reform School, the place for them being, as already stated, State Training Schools of the Colony Type, where, while being given as much happiness as possible in life, they can be segregated and prevented from producing their kind. The establishment of these Training Schools was urged as a crying need. In the United States it is estimated that there are of these unfortunates, in institutions, 23,856, and at large, to procreate, 286,144, a total of 310,000. Massachusetts alone has outside of her institutions 10,000 feeble-minded persons, and the curse and danger to society is that these feeble-minded are the prolific breeders of the feeble-minded—so much so that where the population of the neighboring Republic has doubled, the number of the feeble-minded has quadrupled. May I add that the proportion is about the same for the Province of Ontario, and in view of the increase of juvenile criminality and prostitution—when we know that we have upwards of 5,000 irresponsibles of this class at liberty, the class from which come the born prostitutes—why should the Government hesitate to dyke the stream at its source by seeking to segregate them, yet neither the State nor our Legislatures appear to realize the need, and Judge Frater voiced the feeling of the whole Conference when he said: "Why cannot we get a school for defectives? It is what we have been hollering for for years and so far nothing has been done."

(d) That the Juvenile Court, the object of which is to save the delinquents by whatever means it may, must have connected with it, to reach its greatest efficiency, a psychopathic clinic and department, and for these reasons: First, To know what the mental, physical or social trouble of the deliquent is, in order to rectify it, and, second, in order to discover the vocation for which he is fitted.

As Dr. Colliver, the medical expert of the Los Angeles Court, said: "It takes more than a glance at a boy to know that he has adenoids, while in hundreds of cases the treatment given or operations performed by medical men had prevented the delinquent from pursuing a criminal career."

Such a department includes a medical expert, a pyschologist, with a collaborater, working together to achieve the knowledge above indicated, so that a report can be made to the Judge which will enable him to determine the needs of each delinquent. Within a short space of time the statistics they gather are of untold value. It is the most modern and up-to-date method of saving boys from going to institutions and putting them in the way of living useful and healthy lives. When a delinquent is brought to the Juvenile Court the object is to try and find out the underlying cause of his delinquency. If the child is discovered to be

physically deficient, the thing is to remedy that trouble by medical or surgical treatment, and, in the large majority of cases, the treatment is successful. If the boy is troubled with adenoids or inflamed tonsils, he may be incorrigible from the overtaxed nervous strain which these defects often cause. Often the removal of this cause makes a boy who hated his teacher and his parents, a tractable child, loving his school and home. There are hundreds of these cases on record. Defective eyesight may make a boy vicious. An examination discovers this defect, which is often easily remedied, and after proper treatment the change in the boy's disposition seems almost miraculous. In the matter of mental defects the same principle applies. To discover that a delinquent of twelve has only the mentality of a boy of six is to have the starting point on which to begin the work of regeneration. In short, such a department is science applied to the most vital of all civic questions—the saving of the future citizens—science in co-operation with Christianity. As in Chicago, St. Louis and Los Angeles and other cities, so at Seattle the cost for maintaining this department, though it has the voluntary assistance of Dr. Lillburn Merril, Medical Director of Diagnosis, is provided for by philanthropic citizens. Would that some of the wealthy, child-loving citizens of Toronto might see their way to undertake the endowment of such a department in connection with the Toronto Juvenile Court.

In conclusion, let me refer to the treatment of the insane in the Province of British Columbia. Back of Coquitlan the Government has set aside several hundreds of acres of land, where, under the charge of Dr. Doherty, formerly of Toronto, practically all the inmates are working in the open air at outdoor work, with the most astonishing, not to say miraculous results, a method well worth the study of those having the care of the insane in this Province, and one which is leading the van on this continent in the treatment of the insane.

CONCEIT

Diagnosis—

It was prettily devised of Aesop: the fly sat upon the axle-tree of the chariot wheel, and said, "What a dust do I raise!' So are there some vain persons that whatsoever goeth alone, or moveth upon greater means, if they have never so little hand in it, they think it is they who carry it. —*Bacon.*

Remedy—

Nothing can be better adapted to turn man's thoughts off his own self-sufficiency than the works of Nature.—*Maund.*

THE LAND OF SPOTLESS TOWNS

By FLORENCE WITHROW, B.A.

A sketch of Holland naturally commences with consideration of its unique physical features. The Netherlands is a suitable name for these low countries, which are little more than the alluvial deposit of the Rhine, the Sheldt and the Meuse, and which consist of a fourth as much water as land. The designation "Aquatic Land" is no paradox. Surely Hollanders believe the story of the Deluge, for theirs is a submerged land. Appropriate is their heraldic design—a lion swimming, with the motto Luctor et emergo, "I contend and emerge."

The Dutch have heroically contended against the malignant forces of the sea, which is ceaseless in its menace. "Deep calling unto deep" has made wierd lamentation in this watery land. Villages were sunken fathoms deep, and the fair fields deluged by the insolent Haarlem Sea and Zuider Zee.

Reclamation.

The work of reclamation is beyond comprehension, begun as early as the fourteenth century. Two potent forces, wind and water, were and are still utilized in working windmills to drain the land. Records tell of 26 lakes drained. In 1840 was begun the vast undertaking of wiping out the Haarlem Meer, which covered 45,000 acres and contained a thousand million tons of water. By rains and infiltration thirty-three million tons were added annually. But man's perseverance triumphed, and in five years that treacherous expanse was changed to rich alluvial soil, which has risen from $75 to $1,500 an acre. Herein are the famous bulb fields. A single bulb has sold for $1,000. Men have trafficked in these as in state bonds.

Canals.

To keep the land dry enough for agriculture the Government annually has to pump 45,000,000 tons of water into the canals and thus carry it off—a sort of negative irrigation, so to speak.

These innumerable waterways are not only for drainage, but for highways of

traffic. The longest are the North Holland and the North Sea Canals, which afford short routes to Denmark, Norway and Sweden.

Windmills.

Another marked feature is the windmill. Hundreds dot the flat landscape. Like dervishes they "swhirl," though not in emotional ecstasy, but in the practical service of draining fields, grinding grain, sawing wood, chopping tobacco, etc.

Dykes.

Are of paramount importance. Upon them depend both natural and national defence. In places the sea rages twenty feet above the land, and its thunderous breakers beat against adamantine walls. Little wonder these walls are worth in construction their weight in copper, and that the Government pays four millions annually in repairs, and also claims the right to call men under enforced labor for their restoration.

Physical Features.

The physical conditions of Holland point to it as apparently a "land accursed," with no coal, iron or wood—naturally nothing but bog and fen. Yet it has been made extremely fertile, yielding without enriching for fifty years, and is now the greatest dairy country in the world. Another valuable asset is the inexhaustible harvest of the sea—whale, cod and herring.

History.

In historic incident Holland has passed through as strange vicissitudes as in her physical experiences. She was subjugated by the Romans, was invaded by Germanic tribes and devastated by Normans and Danes. Then for eighty years of the sixteenth century she underwent a deadly struggle with the fiendish power of Spain.

A people of the indomitable courage of the Netherlands were naturally liberty-loving. Furthermore they were religious and enlightened. Little wonder the time came when they would no longer endure the tyrannical rule of a foreign despot.

A Dutch Villiage behind the Dykes.

Philip II.'s father, Charles I. of Spain, better known as the Emperor Charles V., had inherited the Netherlands. When he abdicated and retired to the cloister, he assigned the Imperial crown to his brother Ferdinand, and to his son Philip the sovereignty of Spain and the Low Countries. This Philip II. was not only a bigoted Roman Catholic, who vowed vengeance on all heretics, but was also a military tyrant and cruel extortioner, who loaded the provinces with taxes and

oppressed them with insolent Spanish troops.

The "Estates" begged him to remove the soldiers and to lessen the taxes. But, as his purpose was to establish the Inquisition as it was in Spain, not only did he leave his armies, but he sent more under the crafty Duke of Alva.

The tyranny of the Government and the cruelties of religious intolerance were resented by the Provinces, who, under a native Prince, undertook to throw off the detested yoke. As a member of the House of Nassau and Orange, this Prince William had been a page at the Court of Charles V., who recommended him to Philip's service. His astuteness and diplomacy caused him to be sent on important embassies, one being to Henry II., King of France, husband of the wicked Catherine de Medici, in conjunction with whom Philip was planning his fatal blow at Protestantism.

As a result of this visit, the Prince won the sobriquet "The Silent," not for being taciturn, but for being discreet. On learning of the black plot of the two monarchs for the extirpation of Protestants, he revealed no surprise, but pondered these things in his heart, which he therewith consecrated to God and to his countrymen. Hitherto he had adhered to the Catholic faith, and had evinced no special interest in religious matters. Henceforth he espoused Protestantism and liberty of conscience. Magnificent in audacity as he had been in prudence, he confronted "infinite peril with tranquil courage." Two worthy supporters had he, Counts Egmont and Horn, but they fell early victims to Philip's perfidy and were executed.

Few nobler figures are known in history than this rich and high-bred Prince, accustomed to every refinement of taste and luxury, who for the cause of outraged humanity sacrificed all, even unto his life. Well is he called the "Father of his Country." Never lived a purer patriot or a more incorruptible statesman. With courage, not of despair, but of infinite trust in Omnipotence and in the cause of Right, he dared cope with the most powerful military monarch and the most diabolical Government of his day. With little money but his own, and with faithless mercenaries he was ill prepared to challenge a haughty despot and veteran troops. Nevertheless to him was given the honor of unloosing the iron grip of Spain, of relieving his starving countrymen and of inspiring them to achieve freedom.

Complete independence of Spanish authority, 1609, religious liberty and maritime supremacy were the rewards of almost a century of struggle. Thousands were sacrificed, among them the noble William himself, who was basely assassinated. But freedom was won, and those low aquatic States became the refuge of the oppressed of Europe, where liberty of conscience was assured, and where an honorable Republican Government was established, with Prince Maurice of Nassau, William's son, as Stadtholder.

The House of Orange-Nassau obtains in Holland unto the present day in the person of the beloved young Queen Wilhelmina, a direct lineal descendant of William the Silent. This House has worthily upheld the knightly motto of its founder "Je Maintiendrai." It has maintained the rights and liberties of not only its own country, but of a kindred land, our England, where William III., the great-grandson of the Silent, maintained Protestant liberties against the Catholic Stuarts.

For a short time Holland was in thrall to France, first in 1795 as the Batavian Republic, and in 1806 as the Kingdom of Louis Napoleon, youngest brother of Napoleon I. In 1810 he was forced to abdicate, and in 1813 the Prince of Orange was proclaimed King William I. The severance from Belgium occurred in 1830, since which each country has its own Kings.

(To Be Continued.)

THE STRANGER WITHIN OUR GATES

Oh, these builders of the nation!
  They are men—I tell you—men.
They may not be high in station,
  But they'll teach you now and then
What it means to span the rivers,
  Fashion tunnels, lay the steel,
Curb the waterfall, that quivers
  At the thought of the ordeal.

It's no easy task, I tell you,
  Far from home and friends and all,
Roughest trials theirs to go through,
  But they've heard the country's call,
And they've answered her, these strangers
  Out into the forests vast,
Recking naught of harm or dangers,
  Certain to succeed at last.

From all countries they will answer,
  From the ends of earth they'll come,
Helping us our wilds to conquer,
  If we'll only give them room.
For their lives have been unwholesome
  And they're looking for a spot
Where there's Liberty and Freedom,
  Where it's safe to cast their lot.

What's our duty to these strangers,
  Those who hew and those who draw?
Lawless, these our peace endanger,
  They must answer to our law.
We'll not make them helpers only,
  But we'll teach them to be true
First and last Canadians—simply
  Partners—when there's work to do.

Oh, these builders of the nation!
  They need us and we need them.
We can make them high in station,
  We can make them gentlemen.
We can give them homes beside us
  In our vast dominions wild,
As they give their strength to help us,
  Neighbors—we'll be reconciled.

Editorial

The Third Congress of the Canadian Public Health Association, recently held in Regina, was considered one of the best annual conventions on Public Health ever held. The Association is progressing from strength to strength, and is attracting to itself prominent citizens of Canada, of every shade of thought and activity. In its eight sections it has found a place, it believes, for everyone interested in the conservation of the nation's manhood and womanhood, but there is an elasticity which will allow of other sections being formed if occasion demands. There were deliberations at Regina crystallized into resolutions, some of which are presented herewith. A full report of the Congress will appear in the November number.

Moved by Dr. W. A. Thomson, Regina, seconded by Dr. W. E. Struthers, Toronto.

That, whereas a movement for the establishment of Supervised Playgrounds is widespread, and whereas the results of this movement upon the devolopment of child life have been demonstrated to be of national importance, and

Whereas, the difficulty has been the securing of trained supervisors for the work in our Dominion,

Therefore, be it resolved that each Provincial Government be memorialized to take steps to provide for the training of such supervisors in the Normal schools and universities.

Moved by Dr. D. D. Revell, Edmonton, seconded by Dr. Whitelaw, Edmonton,

That, whereas the Public Health Acts of the several Provinces, and the Medical Practice Acts of the several Provinces of the Dominion of Canada vary and differ from one another,

And, whereas under the Canada Medical Health Act the medical profession in Canada has been placed upon a rational basis,

Therefore, be it resolved,

That a Committee of this Association be appointed to co-operate with a Committee of the Canadian Medical Association to initiate and forward the revision of the Public Health and Medical Acts of the various Canadian Provinces, so as to give a uniform and comprehensive basis for the work of the medical profession in Canada, thus facilitating the formation and operation of the proposed Federal Health Department.

And that a copy of this resolution be forwarded to the Secretary of the Canadian Medical Association.

Moved by Dr. Montizambert, Ottawa, seconded by Dr. Hastings, Toronto,

That the grateful thanks of this Association be hereby tendered to the press of Regina for the kindly publicity which they have given with so much care to the proceedings of this Association.

Moved by Senator de Veber, seconded by Dr. R. E. Woodhouse, Port Arthur,

That the attention of the Federal Government be respectfully requested to the resolution urging the establishment of a Federal Department of Public Health.

Moved by Dr. D. G. Revell, Edmonton, seconded by Dr. H. W. Hill, London,

That, in the opinion of the Canadian Public Health Association, cases of advanced pulmonary tuberculosis may be quite safely cared for under proper arrangements in general hospitals, and that both in the interests of such cases and also more especially for the welfare of those who would otherwise be exposed to infection from such cases, it is highly desirable that pending the establishment of special hospitals for advanced cases, hospitals receiving Government or public financial support be required to provide proper accommodation for the care of cases of pulmonary tuberculosis. Provided, that the municipality where such cases are cared for in its hospital for contagious diseases or other special hospital, the other hospitals in the municipality be exempt from this requirement.

And that a copy of this resolution be forwarded to the Legislatures of the various Provinces.

Moved by Dr. Revell, Edmonton, seconded by Dr. Hill, London,

That the standard laboratory methods of the American Health Association be adopted as the standard of the Canadian Public Health Association.

And that a copy of this resolution be forwarded to the secretary of the Association.

Moved by Dr. Page, Quebec, seconded by Dr. Montizambert, Ottawa,

That the cordial thanks of this Association be hereby tendered to the Government of the Province of Saskatchewan, the City of Regina, Mrs. Brown, Mrs. Seymour, the ladies and gentlemen of the Reception Committee, the authorities of the Regina College and the various social clubs of the city for many kindnesses and courtesies extended to the Association.

Moved by Dr. J. G. Rutherford, Calgary, seconded by Dr. R. A. McLoughry, Moosomin.

That in view of the fact that the education of the modern veterinarian includes suitable training in all branches of animal hygiene and food inspection, the veterinarian so trained is pre-eminently fitted to assume the responsibilities connected with this phase of public health work, this section of the Canadian Public Health Association dealing with veterinary hygiene, food and dairy inspection, desires to urge the importance of appointing properly qualified veterinary officers to act in conjunction with Medical Health Officers on Boards of Health in cities and towns and in rural districts where such veterinarians are available.

Moved by Senator de Veber, Lethbridge, seconded by Dr. A. H. Wright, Toronto,

That, in the opinion of this Association, it is a matter of great importance that the Dominion Government do take steps to create a Department of Public Health in order that all Federal branches dealing with health work may be co-ordinated under one administration.

Moved by Dr. A. H. Wright, Toronto, seconded by Dr. T. H. Whitelaw, Edmonton,

That the grateful thanks of this Association be tendered to the Local Committee, the Government of Saskatchewan, and the Mayor and Corporation of the City of Regina, for the work done in connection with this meeting, and for their generous hospitality.

Moved by Mr. T. Aird Murray, Toronto, seconded by Senator de Veber, Lethbridge,

That the committee formed at the last annual meeting to memorialize the Dominion Parliament on the importance of the prevention of the pollution of waterways, be continued in office in order that the duty for which they were appointed may be finally performed.

PUBLIC WELFARE WORK IN MONTREAL.

It is interesting and encouraging to recognize the rapid and continuous development of Social Service work in Montreal. Within the last twelve months new Settlements, Day Nurseries, Convalescent Homes, Milk Stations, Dispensaries, Vacation Schools and Playgrounds have all begun work in response to the growing needs of this great city. The desire for information and education on the part of the workers themselves is perhaps the most encouraging feature of all. In order to maintain a high standard of excellence, both trained workers and efficient volunteers are needed in our public charities and on philanthropic committees. In response to this desire for greater knowledge and efficiency, we note the recent French-Canadian Baby Hygiene Conference in this city, the deputation of two eminent Catholic Priests to the Congress on "Young Girls and the White Slave Traffic," held in London, and the summer course for country doctors in the Bruchesi Institute for prevention and cure of tuberculosis. We are glad, too, to recognize University cooperation in the splendid extension course on "General Principles of Public Health," to be given in the near future by Dr. T. A. Starkey, of McGill University. The Charity Organization Society recognizes this demand for more knowledge and greater efficiency among local workers and offers a splendid course of lectures and practical work for six weeks beginning October 14th. It will doubtless appeal to many workers on committees, in churches, settlements, etc., and to nurses taking up Social Service work in hospitals or in the City Health Service. The prospectus is as follows:

Training Course in Social Work.

With the kind co-operation of the lecturers the following courses of lectures, study and practical field work is offered by the Social Service Educational Department of the Charity Organization Society. It may be used in part or as a whole by Social Service workers in churches, hospitals, settlements and the like; by officers and commitee members of charitable organizations, and by nurses wishing to secure additional training for city health service or for social service work in hospitals and other institutions. The aim is wholly practical, namely, to increase the number of available and efficient persons, paid or volunteer, who shall stand for earnest work in prevention and cure when facing problems of need and social betterment. The training of volunteers is of great importance. On them as directors of institutions depends the choice of proper officials. As personal workers they help to form sound public opinion, they assist in securing good legislation and administration, and many of them become pioneers in new fields.

A nominal fee of $2 will be charged for the course in order to cover clerical and printing expenses. Tickets for single lectures will be 25 cents.

Lecture Courses.

Tuesdays and Fridays at 4.15 o'clock in the Charity Organization Society Lecture Room:

Oct. 14—The City and Its Social Work, Mr. Albert Chevalier, Director of Municipal Assistance, Montreal.

Oct. 17—Immigration and Assimilation, Mr. Rufus D. Smith, Gen. Sec. C.O.S.

Oct. 21—The Work of the Woman Health Officer, Miss Hurlbatt, Royal Victoria College.

Oct. 24—The Relation of Landlord and Tenant, A. G. Brooke Claxton, K.C.

Oct. 28—Workingmen's Compensation in Quebec, Mr. C. M. Holt, K.C.

Oct. 31—Social Prevention of Mental Diseases, Dr. Colin K. Russel.

Nov. 4.—The Feeble-minded and Backward Children, Dr. Gordon S. Mundie.

Nov. 7—Mental Hygiene, Dr. A. Haig Sims.

Nov. 11—The Problem of Alcoholism, Dr. Fraser B. Gurd.

Nov. 14—Social Aspects of the Administration of Justice, Hon. R. Stanley Weir.

Nov. 18—Medical-Social Problems of Infancy, Dr. F. M. Fry.

Nov. 21—Desertion and Non-Support, Mr. Rufus D. Smith.

Nov. 25.—Neglected and Delinquent Children, Mr. Owen C. Dawson, Juvenile Court.

Nov. 28—Neighborhood Institutions, Miss Elizabeth Helm, Head Worker, University Settlement.

Dec. 2—Social Work and the Church, Expert from the United States.

Opportunity for questions and discussion will be given after each lecture.

In connection with the above course of lectures special trips under direction will be made to typical institutions in order to get first hand knowledge of social work as carried on in Montreal. Among these will be: The Recorder's Court, Montfort Industrial School, Shawbridge Home for Boys, the Juvenile Court, the Settlements, Home for Incurables, Old People's Home, Municipal Lodging House, the Insane Asylums, and the Royal Edward Institute.

Specially directed work in district visiting, case conferences, study of system and records will be offered in November for three weeks of the course to those wishing more intensive and practical field work. Morning attendance for this period of three weeks is required. Students wishing to study Settlement Work at first hand will be afforded a chance of doing so for a fixed period in the University Settlement. As only a limited number of students can be offered these opportunities it is advisable that the names of those wishing to take part should be sent in as soon as possible.

For enquiries and registration address Social Service Educational Department, Charity Organization Society, 70 Jeanne Mance street, Telephone, East 2342.

President, Lady Drummond; General Secretary, Rufus D. Smith, Esq.; Social Service Educational Department, Miss Helen R. Y. Reid, Chairman.

The Book of the Month

By A. C. JAY

HALL CAINE'S STUDY OF THE BABY

IN

"THE WOMAN THOU GAVEST ME"

This latest novel by Hall Caine is fascinating, strangely fascinating. It gripped me so that I could hardly bear to lay it down to attend to necessary and pressing duties. It grips with a compelling grip. The book is written by a master of the novelists' craft, upon a subject that is causing enormous debate throughout the world. Its sales are enormous and its popularity is assured. And yet I have somewhat to say in criticism of the author's powers of observation.

Novelists are teachers. I venture to assert that the great majority of us glean our facts upon many subjects from the pages of novels. We look to them to portray for us certain scenery, or events or actions with perfect truthfulness. And when we read a novel in which certain statements are not according to the truth we are justified in asking ourselves why the author did not make himself more careful of the facts which he is supposed to observe in a field with which he may not be well acquainted.

In his description of the birth and subsequent history of the baby, that was born to Mary O'Neill, Hall Caine proves rather amusing to readers who have spent a good many hundred of their working hours at the bedside of the parturient woman, and who have had to advise mothers by the hundred upon the care of the new-born babe. It is rather strange that no one thus far has pointed out these errors of observation, but they must be patent to every trader who will but take the time to examine them. I shall make numerous quotations from the story.

"It was Saturday, the seventh of June." This is the day of the child's birth. To the medical reader this should prove an interesting chapter, for after an all-night labor, without any mention of the suffering incident to this most important epoch in a woman's life, or any mention of an anaesthetic to soothe, "There was a heavenly calm, in which I could hear the doctor and the nurse and my Welsh landlady talking together in cheerful whispers. I knew that everything was over, and with the memory of the storm I had passed through still in my heart and brain, I said: Is it dead?" It is interesting to note the keen hearing of the woman, the absence of the baby's cry, and the lack of bodily fatigue, the heart and brain taking all the strain, contrary to daily experience. The mother fell asleep, and on awakening saw the nurse siting by the fire with something in her lap. This was also asleep, but presently: "And then came a great miracle. My child awoke and began to cry. It was a faint cry, oh! so thin and weak, but it went thundering and thundering through me. There was a moment of awful struggle, and then a mighty torrent of love swept over me. It was motherhood. My child! Mine! Flesh of my flesh! Oh, God! Oh, God!"

Does this need comment?

"Give her to me. Give her to me."

And the nurse complied. The baby is now in the mother's arms.

"But heaven had taught me another lesson, and instantly, instinctively, I put my baby to the breast. Instantly and instinctively, too, my baby turned to it with its little mouth open and its little fingers feeling for the place."

Evidently this was a most precocious infant.

"That was a long, long day of happiness. It was both very long and very

short, for it passed like a dream."

"First the nurse, from the dizzy heights of her greater experience and superior knowledge, indulged my infantile anxieties by allowing me to look on while baby was being bathed, and rewarded me for 'being good' by many praises of my baby's beauty."

Just what "being good" may be, I am not prepared to hazard, and I venture to say that no nurse that is a nurse would allow a mother to do all these many things a few hours after the baby's advent. And did you stop to wonder why the baby was being washed and dressed now, when this ceremony would in all probability have been duly performed while the mother was sleeping, as described above. But the worst is not yet. When the nurse asked the mother, "Have you ever seen anythink so putty?"

"I confessed that I never had, and when nurse showed me how to fix the binder and put on the barrow coat without disturbing baby while asleep, I thought her a wonderful woman."

Wonderful woman, indeed! She was. Any woman who washes and dresses a baby while asleep belongs to a class apart.

"Every hour, according to the doctor's orders, I gave baby the breast. I do not know which was my greatest joy —to feast my eyes on her while she sucked and to see her little head fall back with her little mouth open when she had enough, or to watch her when she stretched herself and hiccoughed and then grasped my thumbs with her little tight fingers. Oh, the wild, inexpressible delight of it!"

Shades of Hippokrates! Where is the doctor who ever told a mother to put her baby to the breast every hour? Where is the doctor who on the first day ever said oftener than four hours? Where is the baby, in real life, who on the first day grasps anything with its little tight fingers? More precocity, surely, or the novelist has never observed babies on the first day.

"In the afternoon nurse told me I must take some sleep myself, but I would not sleep until baby slept, so she had to give me my cherub again, and I sat up and rocked her and for a while I sang—as softly as I could—a little lullaby."

Truly this must have been a very wonderful first day. A wonderful baby, a wonderful mother, a wonderful nurse, and a wonderful doctor.

"On the fifth day my nurse left me, and shocking as that fact seems to me now, I thought little of it then."

The wonder to me as I perused the chapter, is that she needed a nurse at all.

"Two weeks passed, and if I suffered from getting up too soon, I was never conscious of it."

During the third week the baby was registered according to law.

A few days after "I was preparing Isabel for bed, when I saw a red flush like a rash, down the left side of her face. At first I thought it would pass away, but when it did not I called my Welsh landlady upstairs to look at it.

"'Do you see something like a stain on baby's face?' I asked, and then waited breathlessly for her answer.

"'No—. Yes—. Well,' she said, 'now thee'st saying so—perhaps it's a birthmark?'

"'A birthmark?'

"'Dids't strike thy face against anything when baby was coming?'

"I made some kind of reply, I hardly know what, but the truth, or what I thought to be the truth, flashed on me in a moment. Remembering my last night at Castle Raa, and the violent scene which had occurred there, I told myself that the flush on baby's face was the mark of my husband's hand, which, making no impression upon me, had been passed on to my child, and would remain with her to the end of her life, as the brand of her mother's shame and the sign of what had been called her bastardy.

"How I suffered at the sight of it! How time after time that night I leaned over my sleeping child to see if the mark had passed away. How again and again I knelt by her side to pray that if sin of mine had to be punished, the punishment might fall on me and not on my innocent babe!

"At last I remembered baby's baptism and told myself that if it meant anything it meant that the sin in which my child had ben born, the sin of those who had gone before her (if sin it was) had been cast out of her soul with the evil spirits, what had inspired them.

"This sign of the Holy Cross + which we make upon her forehead do thou, accursed devil, never dare to violate.

"God's law had washed my darling white! What could man's law—his proud but puny morality—do to injure her? It could do nothing!

"That comforted me. When I looked at baby again, the flush had gone, and I went to bed quite happy."

Surely the author knows nothing whatever about birthmarks or heredity. Surely he ought to know that what he has written is very, very far indeed from the facts. I am afraid he has been governed by some tale of a grandmother or some superstition of bygone ages. But we are now living in the twentieth century, and it seems hardly right that a dear and trusting reading public should be imposed upon by words such as these.

But despite all the endeavors of Mr. Hall Caine to kill this wonderful baby, it grew and grew. The poor mother, in her struggling for existence, had to come at last to the position of many a poor and loving parent. She had to place her baby out to board. And what a boarding place. The novelist's picture of the family into whose care this baby was committed, is vivid, but none too vivid. Some of these places are perfect hells. However, even here he does say some peculiar things. On one occasion Mary O'Neill pays a visit to this home (!).

"My child was in a state of deep drowsiness, and when I tried to rouse her I could not do so. I gathered that this condition had lasted twenty-four hours, during which she had taken no nourishment, with the result that she was now very thin.

"I knew nothing of children's ailments, but a motherly instinct must have come to my aid, for I called for a bath and bathed baby, and she awoke and then took a little food."

"But again she dropped back into the drowsy condition, and Mrs. Oliver, who was alarmed, called in some of the neighbors to look at her."

"Hours passed."

"But nothing awakened baby, and towards three in the afternoon (the idea that she was really ill having taken complete possession of me) I asked where I could find the nearest doctor, and being told I went off in search of him."

"Some acute digestive trouble here apparently," he said, "and then something about finding out the cause of it."

"But hardly had he put his hands on my child as she lay in my lap, than there came a faintly discolored vomit."

Then the doctor finds the bottle of dope and throws it out. This is what Hall Caine should have done with this portion of his biography of Mary O'Neill and her baby, for a more weak and sickly bit of writing it would be hard to find. I am not going to discuss the medical aspects of it, but he who runs may read the inaccuracies which are staring him in the face. Why, oh why, will novelists continue to write on such subjects without a keen and surer observation.

But there is still another curious touch before the narrative closes. Martin, the father of the child, returns from his discovering in polar seas, and finds Mary where she "shouldn't ought" to be, rescues the baby from the human fiends in the East End, and they all go down to the doctor's home in the country. So it comes to pass that the baby reaches the age of thirteen months, many of these, as you will remember, spent under bad treatment, poor food and impure air. And yet:

"Such a touching thing happened today. We were all sitting in the garden (sun, warm, light breeze off the sea, ripe corn chattering in the field opposite), when I felt a tugging at my skirts, and who should it be but Isabel, who had been crawling along the dry grass plucking daisies, and now dragging herself up to my side, emptied them into my lap."

Them! Did you ever see a baby of the age of thirteen months do what is recorded here? One daisy, perhaps, but them, oh, dear no. But do you honestly believe she could do it?

I am not in a position to pass upon the narrative of Martin's work in the Antarctic. It was very fascinationg to me. I fancy it must be more correct than the medical news contained in the book. When a novelist enters upon a field he should make himself conversant with it. That is all.

Book Reviews

A Good Book is the Previous Life-Blood of a Master Spirit Embalmed and Treasured.—Milton.

Reading is to the mind what exercise is to the body. As by the one health is preserved, strengthened, invigorated, by the other virtue (which is the health of the mind) is kept alive, cherished and confirmed.—Sir R. Steele.

The great consulting room of a wise man is a library—George Dawson.

THE CARE OF THE BABY.

Many books on the care of the baby are either a compilation of generalities, written by people who do not know the first principles of infant culture, or else a too-minute dissertation upon non-essentials. It is rarely that one finds a book dealing with the subject that can be so highly praised as this by Dr. Brockbank. It is a splendid volume to put into the hands of mothers and nurses, while it will also prove most valuable to the senior medical student or the new doctor just entering practice. The book is most sensible in its suggestions, and great care is taken to present all the features necessary to a full understanding of the duties devolving upon the mother. If this volume were followed implicitly by mothers everywhere, there would be most certainly a lessening of the frightful infant mortality, and our babies would be a happier lot in every sense of the word, while a new and brighter day would dawn for hosts of mothers. But there—mothers seem to be a hard class to reach in this way. However, Dr. Brockbank has done his duty and has presented us with a book containing all that a mother needs to know in a way she ought to know it.

CHILDREN, THEIR CARE AND MANAGEMENT—By E. M. Brockbank, M.D. (Vict.), F.R.C.P. (Lond.), Honorary Physician, Royal Infirmary, Manchester—Henry Froude and Hodder and Stoughton, London—D. T. McAnish and Co., 4-12 College Street, Toronto, Canada—Price, $1.00.

VACCINE THERAPY.

Treatment by means of vaccines and the giving of immunity to various diseases by means of vaccines is very much to the fore these days. So this book on the subject, by Dr. R. W. Allen, is very much up-to-date. It is the fourth edition and the author has taken advantage of this to almost entirely rewrite the book, enlarge it, and bring together all the latest theories and practices upon this subject. The theories advanced about immunity are interesting, one could almost say fascinating, and so much has already been accomplished along this line that it were folly to attempt to predict what will happen next. Here is a treatise both scientific and practical. It deals with the antibodies, their nature, source and functions; the value of opsonic index estimations in diagnosis, prognosis and treatment; the vaccine, its methods of preparation and administration; the rationals of vaccine treatment and some causes of failure. This is preliminary to a resume of vaccine treatment as related to the various systems of the body. There is no system untouched excepting the nervous, and therein lies work for the investigator. Although this is a book on a very special subject, it ought to interest every medical man.

VACCINE THERAPY—Its Theory and Practice—By R. W. Allen, M.D., B.S. (Lond.), Late Clinical Pathologist to the Mount Vernon Hospital for Diseases of the Chest; Late Pathologist to the Royal Eye Hospital; Late Gull Student of Pathology, Guy's Hospital—Fourth Edition—436 Pages—The Macmillan Company of Canada, Toronto.

HYGIENE AND PUBLIC HEALTH.

"The object of this elementary manual is to summarize in a condensed and succinct form, the most important applications of preventive medicine, especially as they concern the routine duties of the

Medical Officer of Health and the School Medical Officer. Such a review must necessarily be tentative and provisional in many ways. Improved methods and appliances, fuller and later statistics and research, and new conceptions and applications are being brought forward year by year. Not only has there been in recent years considerable growth in our knowledge of the etiology of disease and of the conditions of its progress and prevention, but an ever-widening sphere of influence in the state has opened up before the worker in preventive medicine."

This is the author's apologia for the present volume, which is now in its twelfth edition. This book is well known and highly prized by students in the realm of preventive medicine. It is one of Cassel's little red books, and like others of this series it is cram full of matter. It is, moreover, a handy book. When Cassels projected this series of handy text books they conferred a boon upon medical students and practitioners, and the sight of one of these little red books gives a feeling of confidence that the subject contained within its covers is handled in the very best way by the very best authors available. It is thus with the present volume. Anyone desiring a handy, complete, authoritative work on hygiene and public health cannot do better than get possession of this work.

HYGIENE AND PUBLIC HEALTH—By Sir Arthur Whitelegge, K.C.B., M.D., B.Sc., Lond., F.R.C.P., D.P.H., Late County Medical Officer of Health for the West Riding of Yorkshire; Medical Officer of Health for Nottingham and Lecturer on Public Health, Charing Cross Hospital Medical School, and Sir George Newman, M.D., D.P.H., F.R.S. E., Lecturer on Public Health at St. Bartholomew's Hospital; Late Medical Officer of Health of the Metropolitan Borough of Finsbury; Demonstrator of Bacteriology and Infective Diseases in King's College, London.

THE BOROUGH OF TUNBRIDGE WELLS.

We have received from the Medical Officer of Health of Tunbridge Wells, Englang, a copy of his annual report for 1912. It is splendidly gotten up and takes a broad survey of the municipality, as every good health report should do. What appears especially interesting, in view of the fact that we published in our September issue a page of Questions and Answers, by Dr. Roberts, M.O.H., Hamilton, Ont., is that Dr. Burnet has printed a Summary of Statistics for Tunbridge Wells. Although Dr. Roberts has gone far more deeply into his statistics for the City of Hamilton, it will prove interesting to compare the two tables.

Population estimated to the middle of the year, 36,038.

Area of Borough, 3,991 acres.

Rateable Value, £296,066.

Census of 1911—Population, 35,703. Number of inhabited houses, 7,671. Average number of persons per house, 4.6. Density of Population, 8.9 persons per acre.

Number of deaths, 398.

Crude death-rate per thousand, 11.0. Average for previous ten years, 12.1.

Number of deaths of visitors, 4.

Death-rate, if visitors are excluded, 10.9 per thousand.

Death-rate corrected for sex and age distribution, 9.55.

Number of deaths from Zymotic diseases, 14. Death-rate from Zymotic diseases, 0.3 per thousand of the inhabitants. Death-rate from phthisis, 0.66 per thousand living.

Number of births—Boys, 294; girls, 276; total, 570.

Birth-rate per thousand, 15.8. Average for the previous ten years, 17.4 per thousand.

Infantile mortality, 43.8 per thousand born. Average for the previous ten years, 74.6.

Mean annual temperature, 49.1 Fahr.

Hours of bright sunshine recorded, 1,838 hours, 12 minutes.

Total rainfall, 38.20 inches.

NERVOUS BREAKDOWNS.

How common these are, too awfully common in this age of hustle, hurry and worry. Certain people sin against their nervous system, with but one certain result, and it will be well for such to take a book like this and peruse it carefully and thus learn to apply the fundamentals of nervous culture before it is everlastingly too late.

But any man who sets out to accomplish important, and therefore necessarily trying work, is obliged to equip himself with some knowledge of the nervous system—its possibilities, capabilities and its liability to exhaustion.

Truly, as Dr. Musgrove says, "It is the natures of finest fibre which accomplish the most, and it is they who are most liable to give way beneath the strain. A common mug may fall to the ground unharmed, where a piece of costly china would be smashed to atoms."

He is neither "preachy" nor "scary," but informing, inspiring, and helpful throughout.

Dr. Musgrove covers every phase of his subject in an unusually interesting manner. Some of his chapter headings are: Breakdowns, The Danger Signal, Health, The Value of Health, Rewards and Penalties, The Human Engine and How to Stoke It, What to Eat, How to Eat Food, How Much Food to Take, Fresh Air, Exercise, Baths and Bathing, Rest, Sleep, Holidays, Recreation, Hobbies, Work, Worry, etc.

NERVOUS BREAKDOWNS AND HOW TO AVOID THEM—By Chas. D. Musgrove, M.D.—12mo, cloth, $1.00 net—By Mail, $1.07—Funk and Wagnalls Company, New York, Publishers.

THE MANAGEMENT OF THE BODY.

Of making many books upon this subject, there seems to be no end. Some are good and some are compositions of soft nothings which do no good and may do a great deal of harm. This appears to be a book of the helpful kind, written by a medical man, on a sound scientific basis, but which is intended to reach the general public.

Dr. Hirschfeld tells in clear, understandable English the surprisingly interesting story of our heart and how easily it can be kept sound without sacrifice of pleasure and money, and how one can arrange his life to be happy and contented in spite of diseases of the heart and hardened blood vessels, which, at present, cut off prematurely the efficiency of many of our best citizens. The greater part of the book deals with the management of the whole body, which the author convincingly proves to be safe and correct only when it meets the normal, God-made requirements of man in regard to work, recreation, sleep, food, sexual life, climate, progress and society. Much practical information is given as to the causes why so many are not entirely well and how best to choose a physician, nurse, place for recreation, hospital, etc., etc. With its optimism and easily followed suggestions, the book should do much good, and certainly many will regret that it was not written long ago.

THE HEART AND BLOOD VESSELS—Their Care and Cure and the General Management of the Body—By I. H. Hirschfeld, M.D.—12mo., Cloth, Price $1.25 net, by Mail, $1.39—Funk and Wagnalls, New, York, Publishers.

BOOKS RECEIVED.

The following books have been received, and the courtesy of the publishers in sending them is hereby acknowledged. Reviews will be made of these volumes from time to time.

THE CONSERVATION OF THE CHILD—A Manual of Clinical Psychology, presenting the examination and treatment of Backward Children—By Arthur Holmes, Ph.D., Assistant Director of the Psychological Clinic; Assistant Professor of Psychology, University of Pennsylvania—J. B. Lippincott Company, Philadelphia and London—1912—Price, $1.25 net.

THE DIFFICULTIES AND EMERGENCIES OF OBSTETRIC PRACTICE—By Comyns Berkeley, M.A., M.D., B.C., Cantab., F.R.C.P. (Lond.), M.R.C.S., (Eng.), Obstetric and Gynaecological Surgeon to the Middlesex Hospital, London, and Victor Bonney, M.S., M.D., B.Sc., Lond. F.R.C.S. (Eng.), M.R.C.P. (Lond.), Assistant Obstetric and Gynaecological Surgeon to the Middlesex Hospital—Nearly 800 pages, with 287 Illustrations—1913—The Macmillan Co. of Canada, Ltd., Toronto—D. T. McAinsh Co., Toronto.

LONG SAULT RAPIDS, ST. LAWRENCE RIVER—An Enquiry into the Constitutional and Other Aspects of the Project to Develop Power Therefrom—By Arthur V. White, M.E.—Published by the Commission of Conservation, Canada.

Forecast and Review

THE HIDDEN PLAGUE.

From the Desk of a "M.O.H.," in Sanitary Record.

In certain parts of Ireland, where amongst the peasantry the belief in fairies still persists, it is, I understand, regarded as an exceedingly risky, even dangerous, proceeding to discuss their doings. To mention them by name even is to court disaster, and if one so much as utters the word "fairy" he is liable to be instantly struck dead or to be blessed (I cannot resist the Irishism) ever after with bad luck. To get over the difficulty, for one must sometimes, in the intervals of considering Home Rule or chasing the family pig out of the best bedroom, talk of something, one refers to the fairies as "themselves" or "the little people." The method adopted by some of the leading newspapers in connection with syphilis reminds me very much of that of the Irish peasantry. With glaring headline and spirited leader and leaderette they plunge enthusiastically into the agitation which the International Congress of Medicine endeavored to bring to a head, but throughout all the writings the word syphilis is never used, but the phrase "venereal diseases." There are nods and winks and hints and shrugs, and much ingenuity is displayed in finding means of concealing or half revealing what is meant. The nearest they get to its is "the hidden plague."

Who discovered this euphemism I really do not know. My opinion of it is that it is calculated only to make matters worse. It is quite obviously coined out of consideration for the dear old ladies who, to use Mr. Burns' phrase, "mourn over cats," or who occupy dear old world vicarages in rural England, and talk of excesses and unbridled passions once each day during the week, and twice on Sundays. Far better, it seems to me, to keep away from the discussion altogether and take no hand in the fight than enshroud the condition in further mystery. It is because we have, as the Scotch say, been too long "blate" about publicly discussing the venereal infections that there has been so much delay in getting to work on prevention. We too have been filled with the desire to spare the feelings of the dear old ladies and to keep them in ignorance of everything that was not what they would call quite nice. The result has been that we too have become ignorant. We can talk in general terms of the extent of the problem, but of accurate information we have none. Death returns give us none; the death certificate is always discreetly silent with regard to causes of death which it is considered to be not quite the proper thing to suffer from. And registration of sickness is practised only to a limited extent and with regard to only a small number of diseases. Accurate information of the extent of the problem we must have. We must know what it is we have to deal with first. The urgent need is notification.

There is so much talk just now about what is to be done for the disease. Here there is reference to the Contagious Diseases Acts, mainly by people who know nothing about them; then there is a demand for dispensaries for free diagnosis. The talk of the Contagious Diseases Acts is made with the object of preventing anything being done. The time has not arrived to consider whether or not they should be revived. Consideration of that point, as also of that with regard to free diagnosis can wait. It is urgent that we should know where we are, and notification is, in the first instance, absolutely essential. This can be introduced in such a way and made at first so limited in its extent that no feelings or susceptibilities will be injured. To my mind the application of notification to consumption was a far bigger thing than would be its application in the case of the so-called venereal diseases. With the former there was always the pathetic personal side to be considered. Here, though there is unquestionably a pathetic

side, it is less in evidence. The good that would be done was even less apparent in the case of consumption than in that of syphilis. It is even more of a hygienic thing to prevent syphilis than to prevent consumption, and the first step towards this is to obtain notification.

There are many, of course, who say that it is useless to go in for notification, especially a modified form of notification alone, without at the same time arranging for preventive measures. With these I cannot agree. In the case of sphilis the circumstances are peculiar. Notification must come first, and I am not sure that it will not be found to be of itself a preventive. If you have your enemy out in the open you can more easily fight him. If syphilis is brought to this extent out into the open then the Medical Officers of Health in the country know where the cases are; those who batten on the sufferers who go to them because of the dread of possible exposure will be frightened off, and the patient and everybody else will have a much better chance. It is this secrecy that is the dangerous, the killing thing. If the press of the country are going to take the matter up, they must recognize this and must give up their talk of "hidden plagues" and so on. For many months at intervals in these pages the subject has been openly discussed. The lay press should as openly discuss it. It can do a vast amount of good if it will. The Commission which is to be appointed will not fail to see that there is necessity for the taking of action and must recommend that it be taken. If the press will only play its part and take up this health question as it ought to be taken up the report of the Commission will be saved the usual fate of Commissions' reports, and form the basis of action instead of dusty lumber on an out-of-the-way shelf. To begin with the talk of "hidden plagues," however, is to begin badly, and I sincerely hope that harm has not been done as a result.

MIXED SCHOOLS AND MORALITY.

Ever since school medical inspection became general and the doctors got into the schools I have been waiting for one of them to make some statement with regard to mixed schools. And at last it has come. Dr. Adkins, the County Medical Officer of Devonshire, has expressed himself as being strongly against the mixed school for children over eleven years of age, because it is detrimental to them morally, intellectually and physically. He seems to worry most about the girls—their health suffers because they have to work in competition with boys; their morals suffer because they pick up undesirable male acquaintances. Many years ago, when I was doing school work, I was forced to form the same opinions as Dr. Adkins. In all the mixed schools I visited, and I went to many in a large city, I met an atmosphere which I encountered in no other kind of school. There was a softness and unhealthiness about which impressed me profoundly and unpleasantly. Curiously—or perhaps not curiously—it was the boys, and not the girls, about whom I felt worried. Dr. Adkins' objections are mainly because of the girls, but from the moral point of view is it not the boys who suffer most? It always seemed to me in such schools that it was. I detected, or thought I detected, signs that all was not quite as it should be with them. They always seemed to me to be a pallid lot and in need of bracing up. Like Dr. Adkins, one of course heard all sorts of stories which went to strengthen the impressions obtained and the suspicions formed. As a result I came to dislike the mixed school idea more and more, and eventually I determined to ask my Committee to consider the whole matter. Before the opportunity of doing so came, however, I had left the district for another, in which I had less concern with school work. Dr. Adkins' report has brought it all back again, and I am glad to see that I am not alone in condemning the mixed school, and that a Special Committee has been appointed by the Devonshire Education Committee to go into the whole matter. The difficulty is, of course, a money one, as usual; it is cheaper to staff and run a mixed school. It is a pity, however, that because it is going to save so many pounds per annum a system which is "morally, intellectually and physically detrimental to children" should be allowed to continue.—Sanitary Record.

A CANADIAN BUILDER

Virol, Ltd., of London, England, had an attractive exhibit of their well-known food for children and invalids at the recent Canadian Public Health Asociation Congress, held at Regina, September 18th, 19th and 20th, 1913, and from the number of visiting delegates whom we saw at their stand, it was evident that Virol is gaining the interest and support of the medical profession of the Dominion.

Virol is a perfect food composed of red bone marrow extracted from calf bones by chemically pure glycerine, refined marrow fat, highly disastic malt extract, new laid eggs freshly squeezed lemon juice, and soluble phosphates, and is indicated in consumption, anaemia, castric ulcer, malnutrition and wasting diseases. We were informed by Messrs. Saunders & Troy, the representatives in attendance, that since the introduction of Virol to Canada some few years ago, its value as a fat food is becoming more and more recognized by the medical profession and the number of hospitals and sanatoria adopting its use, is rapidly increasing.

The Virol agency will be pleased to send a sample and literature to any medical man on application to Virol, Ltd., 27 St. Peter, St., Montreal.

Tuberculosis Among School Teachers.

The following extract from the report of the Michigan Board of Health is an eloquent comment, and one wonders to what extent similar conditions prevail in Ontario. In questioning the reasons for the shortage of teachers, this might supply one depressing clue. Certainly it does not make school teaching sound a very attractice avocation.

"In making a study of the occupational relation to tuberculosis, one cannot help being impressed by the frequent occurrence of tuberculosis among school teachers. A careful study of the following table will give a very comprehensive idea of the situation:

"Over a period of years 52.4 per cent. of the deaths among school teachers between the ages of twenty-five and thirty-four were due to tuberculosis, while only 25.8 per cent. of the deaths among all persons in Michigan, between the ages of twenty-five and thirty-four were due to this disease. Among school teachers of all ages 27.6 per cent. of the deaths were due to tuberculosis, while among all persons of all ages only 9.4 per cent. were due to this disease.

"This is a matter which should engage the active attention not only of teachers, but of the patrons of the public schools. It would appear from our data that the conditions under which public school teachers labor are conducive to tuberculosis. This is, in a great many instances, an easily established fact. Now this ought not to be. The school teacher, who should be considered as the most valuable factor in the establishment of efficient citizenship, should not be required to work under conditions which are relatively more conductive to the occurrence of tuberculosis than other professions.

"Extreme precautions should be observed by School Commissioners and Boards of Education to prevent teachers who are affected with tuberculosis from continuing in the service. This should be done in the interest of the teacher and in

the interest of the pupils. The solution of the situation, however, should not rest simply with the attempt to prevent infected teachers from being employed. The school officials and the patrons of our public schools should be united in an effort to remedy the existing conditions, that the public school room can in no sense be considered as a place in which one's health is subjected to unfavorable conditions. A more active interest in considering the principles of proper construction, warming, ventilating and lighting of school buildings will go a great way towards remedying this situation.

"And this condition is not one to influence only the teacher who has a predisposition to or fear of tuberculosis. If practically three times as many teachers in Michigan are dying from tuberculosis as are people in other walks of life because of the conditions which surround teachers there, and doubtless in other places as well, what must be the effect produced upon school teachers by the various other germs which are just as readily transferred from individual to individual as are the germs which produce tuberculosis?

Athletics Gone Mad.

We are often told that never was there such a day for sport as the present. We rejoice in the growth of all rational recreation, and there is no more cheerful sight than to pass through the cricket fields, tennis courts, croquet lawns and bowling greens and see thousands enjoying themselves on a Saturday afternoon. The best feature of such a visit is the revelation that middle aged and even elderly people may find pastimes in which change and healthful recreation are combined. What, however, we wish to utter a warning over is the development of strenuous athletics among young people—we mean those scarcely in their teens or not midway between. To talk of having a "Marathon race" for boys still in our elementary schools appears to us to be the height of folly. Many of them are growing rapidly, and with the limited food they get in their homes, the strain of school life and reasonable physical exercise are as much as they can properly bear. A sprint of a hundred yards or even a race of a mile might be entertained for exceptional boys, but to suggest they shall run for five or six miles is asking them to exceed their physical powers and possibly work for their permanent injury. School rivalry should be encouraged in many ways, but not to pit one against another in such displays. We think that school medical officers should step in and prevent such events taking place These officers know only too well how weakness of physique is manifested by large numbers of children, and how necessary it is to restrain them from overtaxing their strength. Therefore, in the interests of the boys, freak athletics should be absolutely prohibited.—The Sanitary Record.

ARMY MEDICAL CORPS.

The following changes have been made in the Militia Department:

Branch of the Adjutant-General, to be promoted to Colonel, Lieutenant-Colonel and Temporary Colonel Guy Carleton Jones, M.D., A.D.C., Director-General Medical Services.

To be Deputy Director-General Medical Services, Major Lorne Drum, Permanent Army Medical Corps.

Miss Florence Withrow will coutribute a monthly travel article to this magazine. She has travelled extensively in North and South America. and has twelve times taken a comprehensive Tour in Europe, and three times in Egypt and Palestine. For 1914 she does not wish to organize a travel party, but desires to offer herself as conductor for a private party. Route and terms optional.

Before and After

9½ lbs. gained in 5 weeks.

These photos were supplied by the Medical Superintendent of a London Infirmary. The first photo was taken on February 3rd. The child then weighed 20 lb. 9 ounces. The second photo was taken March 9th, five weeks after when the child weighed 30 lb. 2 ounces.

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Mr. Labouchere's paper "Truth" investigated the case and stated that "it was neither more nor less than the exact record of indisputable fact."

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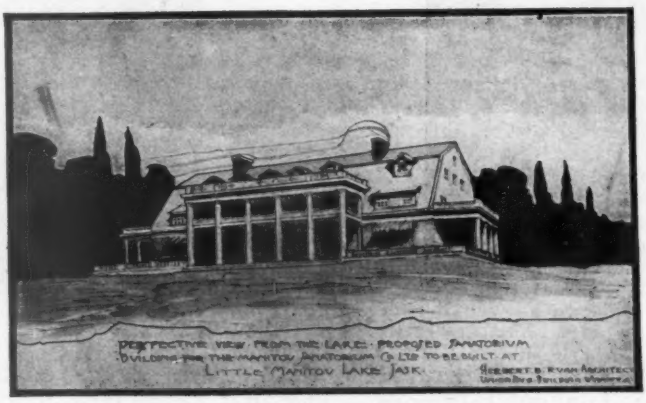
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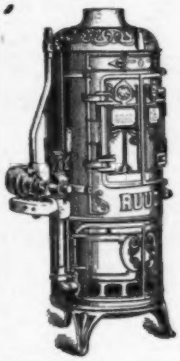

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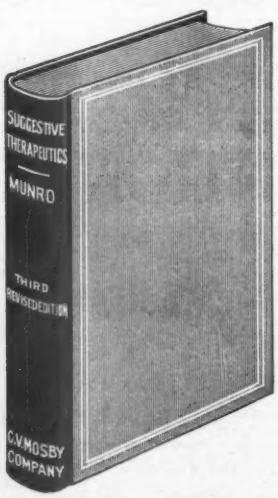

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The Mortality Experience of the

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INVEST YOUR SAVINGS NOW

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Compact and serviceable.

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Sticks 3,000 Stamps
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POLICIES

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Maturing 20-Year Endowment in the ordinary Branch show returns of $140 per $100 paid in premiums.

Full Insurance Protection in addition.

Ask for samples of Actual Results.

THE CENTRAL CANADA LOAN AND SAVINGS CO.

26 King St. East, Toronto.

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Capital (sub.)	$2,500,000.
Capital (paid up)	$1,750,000.
Reserve Fund	$1,550,000.

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Hon. Geo. A. Cox

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Head Office: National Life Chambers,
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Applications received for new assurances for the first three months of 1913 $3,000,000.00, which is an average of a million dollars monthly.

The total volume of business in force on the first of April, 1913, over $20,000,000.00.

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Awake to Your Responsibilities

It is your duty to provide the best possible for your loved ones, and to see to it that the benefits which they enjoy during your lifetime are not curtailed to any gre. . extent after your death. Be sure that your estate is such that it will provide cash when most needed without any sacrifice of securities owing to forced sale.

Life Insurance is the only remedy. Get a policy in

THE

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YOUR HEALTH IS GOOD

to-day, perhaps, but that is no guarantee that it will be good ***to-morrow.***

You may be able to get life assurance ***to-day.*** ***To-morrow***—who knows?

SUN LIFE ASSURANCE COMPANY OF CANADA

Life Assurance creates ***immediately,*** for the benefit of your family in the event of your death, an estate that it would take long years to accomplish by other means.

THE ROYAL BANK OF CANADA

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Capital Paid Up - -	$11,560,000
Reserve Funds - - -	$13,000,000
Total Assets - - -	$180,000,000

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H. S. HOLT, President — E. L. PEASE, Vice-President & General Manager

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Hearts of Oak

IT takes decades to bring the oak from the acorn; but the oak breasts any gale that blows.

For nearly a third of a century the North American Life has driven its roots deep into the bed-rock of financial stability.

To-day its financial position is impregnable.

It is heart-of-oak.

Every North American Life Policy is backed by Thirteen and One Quarter Million Dollars of Assets and by three decades of upright business practice.

The North American Life is a *safe* Company in which to insure.

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Life, 20 Payments. Age at Entry 35. Date, 30th April, 1884.

Total amount of premiums paid	$3,140.40	
Profits paid in cash during premium paying period		$729.10
Profits paid in cash 1905		143.90
" " " " 1910		198.00
	$3,140.00	$1,071.00
Actual cost to 1910		$2,069.00

Note that since 1905 without the payment of any further premiums the policy has been yielding an increasing income.

CANADA LIFE ASSURANCE CO.

HEAD OFFIFE: TORONTO, ONT.

WHAT IS A MUTUAL COMPANY?

A Mutual Company is an association of policyholders for the purpose of securing life insurance at the lowest cost consistent with absolute security.

The reserves are the same as those of other old-line insurance companies. The premiums charged are approximately the same, but—

The profits from all sources are credited solely to the policyholders, and may be drawn in cash or used to reduce future premiums, so that the insurance may be said to be sold "at cost."

The holding of a policy does not involve any financial responsibility beyond that of keeping the contract in force, and the premiums cannot be increased.

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Superintendent of Branches and Secretary - - - George H. Smith.

Paid-up Capital - - $ 6,000,000.00
Reserve Fund (earned) - $ 4,000,000.00
Investments - - - $31,299,095.55

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They are a

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Send for a copy of Annual Report, Specimen Debenture, and all particulars.

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YOU would not be your own Lawyer? Neither would you be your own Surgeon? Why not be consistent with such rules in placing your money?

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The Postal Life Insurance Company pays *you* the commissions that other companies pay their *agents*

ON entrance into the Company you get the agent's average first-year commission less the moderate advertising charge. Other companies give this commission-money to an *agent:* the POSTAL gives it to *you.*

That's for the *first year:* in *subsequent* years POSTAL policyholders receive the *Renewal Commissions* other companies pay their agents, namely 7½%, and they also receive an *Office-Expense Saving* of 2%, making up the

Postal Life Building

Annual Dividend of $9\frac{1}{2}\%$ Guaranteed in the Policy

And after the first year the POSTAL pays contingent dividends *besides*—depending on earnings as in the case of other companies.

Such is the POSTAL way: it is open to *you.* Call at the Company's offices if convenient or *write now* and find out the exact sum it will pay *you* at *your* age—the *first year* and *every other.*

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Second: *Standard policy reserves,* now $10,000,000. *Insurance in force* $50,000,000.

Third: *Standard policy provisions,* approved by the State Insurance Department.

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Fifth: *High medical standards* in the selection of risks.

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In your letter be sure to give:

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